

A Revision of the Genus Aphanistes of America North  
of Mexico (Hymenoptera: Ichneumonidae)

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ABSTRACT

A review of the species of the genus Aphanistes of America north of Mexico has been made on the basis of over 800 specimens from eleven collections. Nineteen species are described, of which fourteen are new.

INTRODUCTION

This study was originally intended to be the first step in a revision of the tribe Anomalini (now elevated to subfamily rank as Anomaloninae; the change in form of the base of the name is justified by a different interpretation of the genus name--see Hopper (1959), p. 159, Anomalon, Note--and required because the other form is preoccupied). However, owing to personal problems, the analysis of the present genus has taken so long that the larger project has had to be abandoned, and I am therefore glad to learn that Dr. Clement E. Dasch of Muskingum College is undertaking a revision of the subfamily.

Since for the most part the characters distinguishing the species of this genus are habitus characters, I have made a great many measurements in an attempt to represent the various proportions in numerical form. Unfortunately, in many cases the measurements either were incorrectly designed or for other reasons do not show what was wanted, or merely show a trend in the direction of what was expected and are not discriminative. In some cases, a measurement that is discriminative for the female is not so for the male (especially those concerning the hindbasitarsus). Consequently, several sets of measurements on which I had spent considerable time have not been included in this paper. In addition, I have been compelled to some extent to use in the keys the relative kind of terminology I had hoped the measurements would eliminate. Possibly other measurements that were not made might have been productive, but either I have not thought of them or they have come to mind too late, after pressure to finish had become too strong. This latter factor has also resulted in less consistency in the species descriptions than I consider desirable, since further studies not strictly necessary would have been needed to make up for the differences in point of view due to the rather large time spread between my study of different species. Some additional studies that I did find necessary were, of course, made.

The catalog data are limited to original descriptions and have been taken from Krombein, Hurd, Smith, Burks, et al. (1979), although all the original descriptions have been consulted (and the types examined).



The description of the genus is a synthesis of published descriptions consulted (especially Gauld, 1976, pp. 41-42 and Townes, 1971, pp. 131-132) plus my observation of the material used for this paper. The species descriptions are based on all specimens at hand.

Collection data of the new species are arranged alphabetically by state or province, then alphabetically by locality, and under this in date order. Certain labels on Forest Insect Survey (F.I.S.) specimens from the Canadian National Collection bearing only a number have not been listed.

Host records have been taken from pin labels and have not been verified.

It should be noted that almost all specimens of the genus that I have seen with identification labels have been misidentified as to species.

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The material examined numbered over 800 specimens, the majority from the Townes collection and the Canadian National Collection, and included the types of all published species.

The following abbreviations have been used to identify the institutions and collections in which the types and paratypes of the new species described will be found.

CHT = collection of Henry and Marjorie Townes, American Entomological Institute, Ann Arbor, Michigan

CNC = Canadian National Collection, Ottawa, Ontario, Canada

Dreisbach = collection of R. R. Dreisbach, Midland, Michigan (now incorporated in the Michigan State University collection).

HPH = collection of the author, Washington, D. C.

MSEL = Michigan State University, East Lansing, Michigan.

Pittsburgh = Carnegie Museum of Natural History, Pittsburgh, Pennsylvania

RTM = collection of Robert T. Mitchell, University Park, Maryland

UCD = University of California, Davis

UMI = University of Michigan, Ann Arbor, Michigan

USNM = U. S. National Museum of Natural History, Washington, D. C.



## TERMINOLOGY

The terminology used in this paper agrees in general with that given in Townes (1969, pp. 36-48). Below I give some definitions of terms not found there or for which my usage differs from that of Townes.

Area dentipara: I use this term (used by European authors, especially for the Ichneumoninae, in which it sometimes gives rise to a tooth), for the sake of brevity, for the second lateral area of the propodeum, which in most specimens is not separated from the first lateral area. If separated, the first lateral area is more than twice as wide as long.

Cheek: The lower part of the gena (as defined in general works, e.g., Pratt, 1940--“temple” of Townes, see below) from the base of the mandible to the point where the orbit begins to turn toward the horizontal.

Crista: The crest or horn (called “lamella” by some authors) on the frons between and above the antennal sockets, between the antennal scrobes, and continuing as a mesal carina to the anterior margin of the stemmaticum.

Gena: The part called by this name in morphological works (“temple” of Townes).

Inner orbit: Either one of the two lateral longitudinal regions of the face adjacent to the orbits, the parafrontal of Pratt (1940, pp. 157-158, plate V, fig. 1), usually set off from the median field (which see) by a more or less distinct longitudinal depression (this is visible also in Townes, 1969, p. 48, fig. F). Called “facial orbit” by Townes.

Interocellar line: The line between the inner margins of the lateral ocelli (or its length).

Median field of face: The mesal portion of the face, the antefrons of Pratt (1940). I have taken the term from Heinrich (1961, 1967).

Metakatepimerum: The upper part of the lateral portion of the propodeum labeled “lower division of metapleurum” in Townes (1969, pp. 44-45, fig. D, 15) and “kem<sub>3</sub>” in Pratt (1940, plate VI, fig. 9), abutting on the hindcoxa.

Metakatepisternum: The lower part of the metapleurum, adjacent to the metasternum (Pratt, 1940, plate VI, fig. 9, kes<sub>3</sub>). The juxtacoxal area of Townes (1969, pp. 44-45, figure D, 16), but note that when the so-called juxtacoxal carina is complete, it reaches the metasternum before the insertion of the coxa.

Metanepimerum: The more or less pillow- or lozenge-shaped structure between the lateral portion of the metanotum (also called “postscutellum”) and the metapleurum (Pratt, 1940, plate VI, fig. 9, aem<sub>3</sub>). The upper division of the metapleurum of Townes (1969, pp. 44-45, fig. D, 14).

Metanepisternum: The structure resembling an expanded carina caudad from the suture between mesopleurum and metapleurum, extending from the base of the hindwing to behind the midcoxa (Pratt, 1940, plate VI, fig. 9, aes<sub>3</sub>).

Metapleurum: The metakatepimerum and metakatepisternum taken together. Although the anepimerum and anepisternum of the metathorax are morphologically part of the metapleurum, in Ichneumonidae they are structurally associated with the mesothorax and are therefore not included in my use of the word metapleurum.

Obsolete: Barely distinguishable, but not completely absent.

Ocellocular line: (The length of) an imaginary line from the lateral margin of a lateral ocellus to the nearest point of the eye margin.

Ocellocular space: An area centering on the ocellocular line, usually differing in sculpture from frons, stemmaticum, and vertex and containing the



orbital spot.

Orbital spot: A spot of color differing from adjacent areas, adjacent to the eye margin and occupying part or rarely all of the ocellocular space.

Paracostula: The portion of the apical transverse carina of the propodeum separating the area dentipara from the petiolar area and third lateral area (the portion bounding on the petiolar area is part of both the apical transverse carina and median longitudinal carina).

Parapsides: The two lateral portions of the mesoscutum (in the strict morphological sense) separated from the mesoprescutum by the notauli. Called lateral lobes of mesoscutum in Townes (1969).

Postocciput: The reflexed flange around the foramen magnum, more or less perpendicular to the occiput. It can be seen in Townes (1969) in figure F, p. 48 but is not labeled. It is the flange that can be seen around part 15 (it is not part 14, 'postocciput' in the legend as originally printed but changed to occiput in the Corrigenda).

Postpetiole: The portion of the apparent first abdominal segment from the anterior margin of the spiracle (including the rim usually present) to the apex of the tergite. Note the inclusion of the spiracle (in contrast to Townes, 1949), which makes a difference in measuring the proportions involving this part in the descriptions.

Prescutum: (mesoprescutum): The portion of the mesonotum between the notauli (median lobe of mesoscutum in Townes, 1969).

Propodeal fossa: I am proposing this term for the longitudinal troughlike depression occurring mainly in the pleural area of the propodeum in most species of Aphanistes. The fossa often appears to involve an adjacent portion of the metapleurum. It actually can be identified in all our species, although in some it is very weakly developed (a flat surface between convex ones, rather than a depression.)

Propodeal pedicel: The pair of processes forming the socket for the petiole.

Scutellar depression: The transverse depression between mesoscutum and scutellum.

Stemmaticum: A more or less distinct portion of the top of the head, encompassing the ocelli and usually a narrow strip outside them. It is often more or less elevated and distinguished from the frons and vertex by sculpture (the ocellar triangle of Townes, 1969).

Subantennal carina: The carina surmounting the ridge found below and in front of the antennae.

Temple: The upper part of the gena (in the morphological sense, see above) from about the summit of the eye to where the line of the gena begins to become less strongly curved. (Note difference from definition of Townes, 1969).

## MEASUREMENTS

The following criteria apply to the measurements given: The length of the forewing is measured from the distal margin of the tegula to the tip of the wing. The body length has been determined progressively (no doubt giving a result somewhat exceeding the length of the living insect in a natural attitude, but one which is replicable), i.e., from the edge of the subantennal carina (note that the head is included here in the term 'body') to the apex of the propodeal pedicel, from that point to the caudal margin of the first tergite, and thence to



the apex of the abdomen (excluding the terminalia) in as many instalments as required by its positioning. The antenna length has in some cases been measured by relaxing the appendage and straightening it, thus providing a precise measurement, or in many instances the length has been approximated by successive measurements along the curves or, less often, by estimating--the total includes the scape and pedicel. The number of antennal segments includes only those of the flagellum. The length of the first flagellar segment in relation to its width is measured viewed in the narrowest aspect, taking the width at the distal end and the length along the centerline including the proximal bulb of the segment that usually appears to be part of it and is considered to be so by Pratt (1940), but I have known it to separate as if it were a distinct segment, which it is considered to be by Gauld (1976, p. 5, "anellus"--doubtless this is the correct interpretation). The combined length of the second and third flagellar segments times the first is also taken from measurements made along the midline (not to the farthest point of the oblique margin of the segments).

The various proportional measurements are made as indicated below.

The head thickness-width ratio is the maximum span across the eyes divided by the distance between a transverse line tangent to the central prominence of the subantennal carina and a line parallel to it drawn across the outer edges of the occipital carina with the head oriented to bring the lateral extremes of the eyes, the central prominence of the subantennal carina, and the postocciput into focus simultaneously (differing orientation of the plane of the occiput gives very different results in the measurements).

The head length-width ratio is the eye span determined as in the foregoing divided by the length of the head from the tip of the clypeal tooth to the summit of the lateral ocellus. The eye span may be measured either from in front or from above, and the length I have measured with the head in profile oriented to bring the tip of the clypeal tooth and the tip of the frontal crista into focus simultaneously.

The head thickness-camber ratio is the quotient of the thickness of the head determined as for the head thickness-width ratio divided by the length of the perpendicular from the midpoint of the occipital carina to a line drawn across the outer edges of the occipital carina, with the head oriented as above.

The occipital camber is the quotient of the length of a line connecting the outer edges of the occipital carina divided by the length of the perpendicular from that line to the midpoint of the occipital carina, with the head oriented as above.

The head-occiput width ratio is the eye span as measured above divided by the distance across the outer edges of the occipital carina, with the head oriented as indicated in the foregoing.

The eye-temple ratio is the quotient of the length of a line parallel to the midline of the head measured between perpendiculars to the midline at the anterior and posterior points of the eye, divided by the distance between a line across the outer edges of the occipital carina and a line parallel to it through the posterior margin of the eye, with the head oriented as above.

The mesoscutum index is the quotient of the length of the mesoscutum as defined above by its width, the length measured from the cephalic margin of the prescutum to the bottom of the scutellar depression, with these two points in simultaneous focus, and the width across the widest point (usually formed by two slight eminences in the upturned marginal carina of the mesoscutum and always just mesad of the forward edge of the tegula) with the two sides in simultaneous focus (usually all four points can be brought into focus simultane-



ously).

Head width  $n$  times mesoscutum width is the quotient of the former divided by the latter. The measurements are made as already described.

The scutellum proportions are given in the form  $1:x:y$ , where 1 represents the width of the disc of the scutellum measured across the anterior edge (not including the apophyses joining it to the scutum),  $x$  is the length from the cephalic margin (usually marked by a more or less distinct carina) to the caudal margin (including the more or less flangelike apical carina), and  $y$  is the apical (caudal) width of the disc between the lateral carinae (if present) in front of the apical carina.

Depth:width:length of propodeum is given in the same form as the foregoing, taking the depth as unity. The depth is measured from the highest point of the median longitudinal carina at approximately the anterior end of the areola to the tip of the small, flat lobe at the point where the lower anterior margin of the metapleurum meets the metasternum near the midcoxa, the width is measured at the widest point as viewed from above or below, and the length is measured in profile from the depression that appears to be the anterior boundary to the tip of the propodeal pedicel.

“Hindbasitarsus  $n$  times as long as thick” is the quotient of the visible length divided by the maximum thickness of the segment in side view (perpendicular to the plane of motion of the tibia relative to the femur), which may be either at or near the distal end.

“First tergite  $n$  times as long as hindbasitarsus” is determined from the visible length of the former measured from the tip of the propodeal pedicel to the caudal margin of the postpetiole, divided by the length of the latter measured as in the preceding paragraph.

“Width of postpetiole  $n$  times length” is the quotient of the maximum width of the postpetiole (whether across the spiracles or behind them) divided by its length according to the definition.

“First tergite  $n$  times as long as postpetiole” is determined according to the specifications in the two previous paragraphs.

#### Genus Aphanistes Foerster

Aphanistes Foerster, 1868. Naturh. Ver. preuss. Rheinl., Verh. 25: 145.

Type: Anomalon bellicosum Wesmael. Desig. by Viereck, 1914.

Anochilacrum Enderlein, 1921. Stettin. ent. Ztg. 82: 12.

Type: Anochilacrum flavigena Enderlein. Monotypic and orig. desig.

Apex of clypeus prolonged into a moderately large tooth, clypeus separated from the face in our species by a shallow, rounded indentation, sometimes reduced to merely a slight change of direction, never a sharp groove or suture, usually with considerably fewer and larger punctures than face, with difference between species in this usually not readily perceptible. Frons with a short, high median longitudinal carina or lamella between and just above antennal sockets and extending to the median ocellus and forming a crista (flattened horn or tooth--absent in some exotic species). Occipital carina sometimes not as near outer margin of head as in most other genera of the subfamily, the width across the eyes in ours being from 1.14--1.55 times the width across the occipital carina (the former value typical of the subfamily, the latter not so--some species with intermediate head-occiput width ratio have the temples bulging, so that the head appears wider behind than indicated by the ratio). Ocelli usually



of medium size (their diameter approximately equal to ocellocular and inter-ocellar lines), in some species (only one of ours) very much larger. Eye sometimes completely hairless, more often with sparse hairs of about the length of the diameter of an ommatidium (visible only at about 30x). Upper tooth of mandible slightly longer. Occipital carina complete, joining oral carina at base of mandible. Epomia moderately to strongly divergent from the carina along collar, then curved dorsad; enclosure from slightly larger than tegula to about one-fourth that size. Mesoscutum descending abruptly cephalad with a narrow flat shelf or concavity just behind the anterior margin and before the abrupt portion; mesoscutum more or less punctate. Notauli rarely sharp, more often narrow and distinct to broad and shallow to indistinct or obsolete (occasionally indicated only by elevation of the prescutum above the parapsides); they rarely meet before the prescutellar patch (usually black and ruguloso-reticulate, with transverse rugulae predominant), more often disappearing into it. Disc of scutellum from slightly concave to fairly strongly convex, lateral carina from strong to obsolete (I believe it is never wholly absent in our species, but may be very difficult to distinguish); disc sometimes with a median longitudinal depression (sometimes relatively narrow, sometimes extending the full width, in which case it is cylindroid). Prepectus sometimes barely differentiated on mesopleurum, carina always present on sternum, extending either just barely above the sternaulus or farther according to species, but never clearly reaching margin of pronotum above; sternaulus rather distinct to obsolete, one-third to one-half the length of mesopleurum. Propodeum rugose-reticulate, usually without distinct carinae and areolation, although portions of most can be distinguished, especially the pleural carina, the portion of the lateral and median longitudinal carinae along the areola and area dentipara, these areas (the areola never distinctly closed behind and the area dentipara rarely separated from the first lateral area) and the basal area (very short and descending abruptly into the groove between propodeum and postscutellum); irregularity of the bounding carinae and the presence of internal reticulations may considerably obscure the area dentipara, but never completely in our species, and actually most of the other portions of the carinae can be made out as zigzag lines stronger than the intersecting rugulosity, which, for instance (in combination with the conformation of the propodeum) permit the petiolar area to be made out. The caudal extremity of the propodeum is produced as a pedicel to which the petiole of the abdomen is articulated. Forecoxa without carina, occasionally barely convex below, sometimes moderately convex below, in one North American species with an oblique ridge (not sharp) below. Midtibia with two spurs, hindtibia and -tarsus unspecialized, the latter more slender and parallel-sided or rarely tapering distally in female, stouter and usually diverging distally in male (in female sometimes slightly compressed in plane of tibia-femur, in male often broader at right angles to this plane). First abscissa of discoideus not nearly in line with and distinctly shorter than discocubitus; postnervulus broken slightly below middle (subdiscoideus below middle of brachial cell); second recurrent distinctly postfurcal (distad of second intercubitus); first abscissa of radiella longer than intercubitella; nervellus distinctly broken well below middle; areolet (second intercubitus) absent. Ovipositor 0.75-1.3 times the length of the first tergite in our species.

Insects of moderate size (in our species, forewing 4.86-14.55mm, body including head 8.3-24.3 mm), varying in color in North American species from yellowish fulvous to ferruginous, with tip of mandible, top of head more or less (at least part of stemmaticum), apical one-third to one-half of hind-



tibia, and second tergite except lateral margins, black; usually also black are upper part of occiput, patch on mesoscutum before scutellum, and hindcoxa above; often also black are a spot below wings, metanepimerum, spot at base of propodeum, sterna and hindtrochanters more or less, and spot or spots on apical tergites; rarely thorax wholly black; clypeal tooth (mucro) fulvous to piceous. Tegula always luteous to fulvous. In one species, abdomen wholly or almost wholly piceous.

Hosts of specimens examined (according to pin labels) are Geometridae, Noctuidae, and Notodontidae.

Consideration of the various characters shows that the interrelations of the species are by no means linear, so that the sequence adopted is a mere approximation to the actual relationships. The key that follows is artificial and does not express the relationships of the species.

Key to the species of Aphanistes of North America north of Mexico

1. Ocelli very large, ocellocular line not more than 0.5 times diameter of lateral ocellus; eye very large.
  1. crepuscularis, new species (p. 13)
- Ocelli not so, ocellocular line 1.0-2.0 times diameter of lateral ocellus; eyes usually relatively smaller. . . . . 2
2. Second tergite dark to lateral margins. Abdomen usually wholly dark brown; at least apical tergites partly or wholly brown to piceous. Midcoxa nearly always infusate below. (Hindfemur stout, usually dark brown, at least above. First tergite usually distinctly deeper than wide before spiracles or both deepened and widened. Face and clypeus in profile forming nearly straight line; top of head, mesoscutum, and mesopleurum rather strongly punctate, opaque; interocellar line 1.14 times ocellocular line; temple usually distinctly bulging; head width ♀ 1.27-1.4, ♂ 1.24-1.38 times mesoscutum width.)
  4. edemae (Davis) (p. 19)
- Second tergite not dark to lateral margins. Third and fourth tergites never dark brown. Midcoxa always yellow or ferruginous below. . . 3
3. Petiolar area and third lateral area of propodeum usually with only transverse rugae or rugulae. Scutellum usually rather rounded at apex. Propodeum usually with transverse black band at base, metakatepisternum usually yellow; thorax and propodeum more or less tinged with yellow. (Head moderately convergent behind, temple nearly flat; median field of face with few or no longitudinal wrinkles; head width ♀ 1.4-1.6, ♂ 1.40-1.43 times mesoscutum width; frons rugulose; stemmaticum and vertex behind ocelli closely deeply punctate, more or less rugulosopunctate; interocellar line 1.125 times ocellocular line; hindfemur slightly stout; hindbasitarsus ♀ 9-11, ♂ 8-11 times as long as thick; first tergite usually apically black or piceous, lighter anteriorly--entire tergite sometimes fulvous in small specimens.)
  3. hyalinis (Norton) (p. 16)
- Petiolar area rarely with only transverse rugae. Scutellum truncate at apex. Propodeum rarely with transverse black band, metakatepisternum not yellow (Metapleurum yellowish in one species, in which temple rather convex and sculpture rather fine). (First tergite rarely bicolored.) . . . . . 4



4. Forecoxa with strong, oblique ventral ridge (narrowly rounded, not a carina), surface on either side of ridge not smoothly rounded, distally rather flat, proximally slightly concave. (Mesothorax rather strongly punctate; face rather narrow and markedly convergent below).  
6. coxatus, new species (p. 23)  
Forecoxa usually uniformly rounded (rarely with an indistinct ridge barely differentiated from the rounded surface). . . . . 5
5. Head strongly convergent behind, relatively thin front to back, temple nearly flat; top of head, mesoscutum, and mesopleurum moderately strongly punctate, subpolished. (Notauli broad, distinct; side of propodeum only weakly convex; hindfemur slender; interocellar line shorter than ocellocular line; hindbasitarsus ♀ 12.25-15.6, ♂ 8.8-9.6 times as long as thick. . . . . 2. gracilis, new species (p. 14)  
Head not so or head, mesoscutum, and mesopleurum either weakly punctate and rather polished or very strongly punctate and opaque. (Notauli either quite sharply impressed or indistinct, or if broad but distinct, scutellum appears at least as wide as long; propodeum usually more rounded; hindfemur usually medium to stout). . . . . 6
6. Hindbasitarsus brown at base; prepectus and adjacent area of mesopleurum yellow; first tergite at least slightly wider than deep throughout. (Small insects.) . . . . . 15. fuscipes, new species (p. 45)  
Hindbasitarsus not brown (though sometimes deeper yellow) at base; prepectus not yellow; first tergite usually not wider than deep throughout. . . . . 7
7. Scutellum appears square or wider than long, little narrowed behind; epomia short, enclosure small; propodeum with median longitudinal carina distinct and other traces of areolation; mesoscutum index 0.93-1.14 (rarely 1.22); thorax, hindfemur, and hindbasitarsus very stout; pronotum quite narrow front to back; postpetiole rather long in proportion to petiole. (Head subbuccate to buccate.) . . . . . 8  
Scutellum appears longer than wide or distinctly narrowed behind, or epomia and propodeum not so; mesoscutum index usually over 1.15; thorax, hindfemur, and hindbasitarsus variable; pronotum not markedly narrow; postpetiole usually relatively shorter. . . . . 10
8. Scutellum distinctly elevated anteriorly, with rounded transverse angle between steep anterior surface and sloping disc with distinct median longitudinal depression; space enclosed by epomia about one-half as wide as long; face much wrinkled and punctate, inner orbit moderately punctate; upper third of clypeus with more than one-half as many punctures per unit area as face except in a few of smallest specimens; petiole distinctly elevated before spiracles.  
17. crassulus, new species (p. 50)  
Scutellum flat, sometimes very slightly depressed; space enclosed by epomia less than one-half as wide as long; face more weakly rugulose, inner orbit broadly nearly impunctate; clypeus not so; entire first tergite distinctly flattened throughout, petiole rarely very faintly elevated before spiracles. . . . . 9



9. Rather extensively black; notauli obsolete but prescutum distinctly raised above parapsides; stemmaticum rather strongly elevated at lateral ocelli in female (hardly in male); top of head rugulose-reticulate-punctate, most strongly on vertex behind ocelli, grading from subpolished on frons to subopaque on vertex; head rounded-rectangular and moderately transverse, lower part of face and clypeus moderately short in profile; cheek narrow, especially below; mesoscutum and mesopleurum moderately finely densely deeply punctate (more coarsely and shallowly on pleurum), subopaque; ovipositor longer than first tergite, distinctly decurved in apical two-fifths.

19. decurvihastatus, new species (p. 54)

Usually with little more black than typical of genus; notauli fairly distinct though not sharp and prescutum little or not at all raised; stemmaticum little elevated; top of head, mesoscutum, and mesopleurum polished, punctation sparse and weak; head buccate, transverse, lower part of face and clypeus quite short in profile; ovipositor variable in length, not decurved, rather deep in proportion to length, nodus rather long and large, and tip long. . . 18. flaviscutellaris, new species (p. 53)

10. Eye projecting little from head outline in plan view, head moderately to strongly buccate; gena and vertex weakly punctate and polished; face and clypeus in profile forming nearly straight line; curve of occiput relatively flat (occipital camber 4.6-6.1); temple usually forming rather sharp, sometimes very sharp angle with occiput; notauli weakly indicated, represented chiefly by change of direction of surface from parapsides to prescutum; scutellum sometimes slightly wider than long but convergent behind, moderately elevated, lateral carina obsolete; propodeum usually rather polished with weak rugulosity; hindbasitarsus 6.5-8.3 times as long as thick. (Known so far only from California excepting one specimen from Texas.)

16. puparum (Ashmead) (p. 48)

Eye projecting from outline of head in plan, head not buccate, or notauli distinct, or scutellum carinate and relatively narrow, or otherwise different. . . . . 11

11. Scutellum rather gibbous, relatively wide but convergent behind, lateral carina more or less reduced; propodeum rather distinctly bulging laterally, usually with reduced rugulosity and only fine reticulation. . . . . 12
- Scutellum usually flat or medially depressed (or if slightly elevated, highly polished and lateral carina distinct) appearing distinctly or moderately narrow, lateral carina usually distinct; propodeum with side weakly convex, usually moderately extensively reticulate with fairly strong rugae. . . . . 13

12. Hindbasitarsus stout (♀ 7-10, ♂ 5.6-8.3 times as long as thick); 32-41 flagellar segments, first segment ♀ 3.7-4.6, ♂ 3.8-5.2 times as long as wide; thorax somewhat coarsely punctate, often extensively black.

9. enargiae, new species (p. 29)

Hindbasitarsus slender (♀ 11.04-12.8, ♂ 9.0-10.5 times as long as thick); 42-43 flagellar segments, first segment ♀ 4.8-6.0, ♂ 4.2-6.1 times as long as wide; thorax otherwise. . 10. masoni, new species (p. 33)



13. Head rather strongly narrowed behind, temple flattish; temple, frons, vertex and stemmaticum with rather small, shallow punctures separated by more than their diameter, polished, crista small, frons and vertex rather distinctly convex, especially stemmaticum; mesoscutum and mesopleurum polished, punctures shallow and separated by about one-half their diameter; outer surface of hindtibia at most yellowish, never yellow. (Small insects.). . . 5. politus, new species (p. 21)  
 Head not narrowed behind, temple not flattish; top of head more strongly punctate, subopaque, not or weakly convex, crista fairly prominent, usually not small; hindtibia yellow on outer surface. . . . . 14
14. Head and thorax wholly coarsely punctate, opaque; notauli indistinct; scutellum moderately elevated, highest at one-fourth to one-third its length, usually with strong (sometimes very strong) lateral carina and always somewhat longitudinally concave; thorax wholly black except tegula; first tergite strongly infusate or piceous above, postpetiole elliptical in section with axis vertical.  
 . . . . . 7. nigrorufus (Norton) (p. 25)  
 Head and thorax less strongly punctate, subopaque, subpolished, or polished; notauli distinct; scutellum little or not at all elevated, highest very close to cephalic margin; thorax rarely wholly black; first tergite usually not infusate or piceous, form of postpetiole variable. . . . . 15
15. Mesoscutum without black markings except usual patch before scutellum and occasionally a minute medial line cephalad; side of propodeum very weakly convex. . . . . 16  
 Mesoscutum with at least a black medial band or distinct line or anterior spot, usually more extensively black; side of propodeum distinctly convex though not more than slightly bulging. . . . . 17
16. Head in plan view more or less elliptical and when tilted to bring anterior edge of median ocellus to forward edge of head, edge of head appears nearly straight across frons from forward edge of one eye to the other; posterior margin of eye not transverse as in next alternative; notauli rather sharply impressed. (Head not thick in profile; epomia forming smooth curve, not parallel to collar; petiole rather slender, not raised before spiracles.). . . . . 12. basilicon (Davis) (p. 38)  
 Head more or less buccate (except some small males), frons not straight across when viewed as above; posterior margin of eye more or less transverse when occiput in line of sight; notauli indistinct or obsolete. (Head in profile rather thick, often more or less nearly circular; epomia with abrupt curve below, remainder nearly parallel to collar; petiole usually distinctly raised before spiracles, not particularly slender.) . . . . . 11. walleyi, new species (p. 36)
17. Head and thorax highly polished; frons, stemmaticum, and vertex rather weakly punctate, with a few weak rugulae around stemmaticum, never reticulate, all three weakly distinctly convex except for smallish antennal scrobes; notauli indistinct, shallow, marked by an irregular line of punctures; scutellum polished, not elevated, slightly longitudinally depressed, with usually relatively sparse but rather large punctures that sometimes partially run together to form longitudinal



aciculations, lateral carina almost always very strong, disc sometimes wholly black; petiole elevated before spiracles in most specimens; hindfemur stout; nodus of ovipositor usually decidedly abrupt distad.

14. heinrichi, new species (p. 43)

Head subpolished to opaque, frons often rugulosoreticulate and fairly strongly rugulose around stemmaticum, slightly concave or only very slightly convex before median ocellus; notauli distinct, usually sharply impressed; scutellum subopaque, slightly elevated, usually not longitudinally depressed, with relatively smaller, considerably denser punctures, never aciculate, lateral carina moderate or occasionally weak, rarely wholly black or piceous; petiole not elevated; hindfemur variable; ovipositor not so. . . . . 18

18. Head usually subopaque with rather dense moderately deep punctures, often rugulosopunctate on frons, which is slightly concave behind antennae (in addition to the antennal scrobes present in all species); temple progressively less punctate and more polished than vertex; epomia forming smooth curve and enclosing rather narrow space with maximum width usually less than one-half length, without noticeable rugulae; notauli usually not sharply impressed, but distinct; maximum width of prescutum greater than that of one of parapsides, prescutum distinctly raised above parapsides; scutellum slightly wider (length 0.95-1.15 times width), usually with black mark at base; propodeal fossa rather distinctly impressed, pleural carina usually stronger than others; outer carina of area dentipara moderate; metapleurum slightly bulging; petiolar area rather distinctly longitudinally depressed; hindbasitarsus ♀ 7.4-10.8 times as long as thick; first tergite usually partly or wholly piceous or black, in ♂ 0.9-1.1328 times as long as hindbasitarsus. . . . . 8. townesi, new species (p. 27)

Head more subpolished, frons slightly convex with little rugulosity; temple abruptly less punctate and more polished than vertex; lower end of epomia approximately at right angle to remainder, with short ramus at angle, enclosure moderately large, usually one-half or more as wide as long, with ladderlike crosswise rugulae; notauli usually sharply impressed; maximum width of prescutum usually approximately equal to that of one of the parapsides, prescutum not noticeably raised above parapsides; scutellum usually narrower (♀ 1.1-1.4, ♂ 0.93-1.14 times as long as wide--but appears narrow in both sexes), usually without black mark at base; propodeal fossa slightly to distinctly impressed, pleural carina indistinct or obsolete; outer carina of area dentipara usually quite strong; metapleurum only moderately convex, not bulging; petiolar area nearly flat; hindbasitarsus ♀ 10.8-14 times as long as thick; first tergite very rarely black or piceous, in ♂ 1.326-1.65 times as long as hindbasitarsus. . . . . 13. dreisbachi, new species (p. 40)

### The Crepuscularis Group

The group is characterized by the very large ocelli, short temples convergent caudad, fulvous color with reduced black markings, extensive pale-yellow markings on thorax in male, and slender form. It contains only the species crepuscularis.



1. Aphanistes crepuscularis, new species

Female: Forewing 10.3-14.5 mm, body [see 'Measurements' above] 16.5-24 mm; antenna 11-16 mm, 43-48 segments, first flagellar segment 4.9-5.1 times as long as wide, combined length of second and third segments 0.87-1.0 times first; head thickness-width ratio 1.80-1.87, head length-width ratio 1.2-1.26, head thickness-camber ratio 2.65-3.6, occipital camber 4.3-4.5, head-occiput width ratio 1.49-1.55, eye-temple ratio 3.0-3.9; mesoscutum index 1.25--1.34, head width 1.64-1.66 times mesoscutum width, scutellum 1:1.05--1.34:0.47--0.77; depth: width:length of propodeum 1:0.98--1.06:1.06--1.17; hindbasitarsus 9.0--12.3 times as long as thick, first tergite 1.1-1.5 times as long as hindbasitarsus; width of postpetiole 0.50--0.57 times length, first tergite 3.72--8.84 times as long as postpetiole.

Habitus rather slender. Eye and ocelli very large, ocellocular line not more than 0.5 times diameter of lateral ocellus; face rather flat; head rather strongly convergent behind, temple nearly flat, cheek narrow, head rather thin. Notauli moderately strongly, rather sharply impressed; scutellum very slightly convex, sometimes with a slight longitudinal depression anteriorly; propodeum with anterior portions of pleural, lateral longitudinal, and median longitudinal carinae present, not very closely rugose, rugulose between rugae; areola distinct but open behind, second lateral area recognizable but indistinctly bounded; mesoscutum and mesopleurum subpolished, rather densely punctate, punctures separated by approximately one-half their diameter; epomia indistinct at lower (outer) end, often wholly indistinct, inner end weakly curved forward.

Fulvo ferruginous. Antenna fulvous; vertex, temple, and mesoscutum ferruginous; face, clypeus except tooth, mandible except tip, cheek, fore- and midlegs (sometimes stramineous), lower surface of hind distal trochanter, and proximal two-thirds of hindtibia yellow; tip of mandible, distal one-third approximately of hindtibia, dorsum of second tergite except lateral margins, sometimes stemmaticum at posterior edge of median ocellus, and sometimes spot on mesoscutum before scutellum and spot on base of propodeum, black; hindcoxa dorsally or wholly, proximal hindtrochanter wholly, and distal hindtrochanter dorsally black or piceous. Side of scutellum wholly fulvous except anterior black spot in most Canadian and Transition Zone specimens and the male from Great Smoky Mt. Nat. Pk. (black in most specimens of most other species). Wings subhyaline.

Male (only two specimens seen): Forewing 10.6--10.7 mm, body 19.8--20.5 mm; antenna 14.2 mm (tip lacking in one specimen), 48 segments, first flagellar segment 4.56--4.84 times as long as wide, combined length of second and third segments 0.98--1.0 times first; head thickness-width ratio 1.69--1.75, head length-width ratio 1.16--1.18, head thickness-camber ratio 3.4--4.2, occipital camber 4.0--5.0, head-occiput width ratio 1.4--1.45, eye-temple ratio 2.85--2.9; mesoscutum index 1.12--1.27, head width 1.575--1.6 times mesoscutum width, scutellum 1:1.13--1.3:0.63--0.73; depth:width:length of propodeum 1:1.05--1.0625:1.125--1.1875; hindbasitarsus 9.02--10.26 times as long as thick, first tergite 1.257--1.259 times as long as hindbasitarsus; width of postpetiole 0.5--0.6 times length, first tergite 3.72--3.88 times as long as postpetiole.

Form and sculpture as in female except usual difference in tarsi.

Color as in female except marks on pronotum, margins of mesoscutum, scutellum more or less, lower portion of mesopleurum, especially cephalad (extensively), and metapleurum more or less, very pale yellow (nearly white).

Material examined: 28♀♀, 2♂♂.



Type: ♀, Wake Co., NC, VII-1 1951, H&M Townes (CHT); allotype: ♂, Cleveland, SC, VI-5 1961, G. F. Townes (CHT); paratypes: ♀♀, Tuscaloosa, Ala., V-13 1948, R. L. Chernock (CNC); Atlanta, Ga., 5-4-36, P. W. Fattig (CHT); Atlanta, Ga., 5-13-36 (USNM); Atlanta, Ga., 5-11-37, P. W. Fattig (CHT); Atlanta, Ga., 5-18-39, P. W. Fattig (USNM); Atlanta, Ga., 5-24-39, P. W. Fattig (USNM); Atlanta, Ga., 5-30-40, P. W. Fattig (USNM); Atlanta, Ga., 5-16-41, P. W. Fattig (USNM); Atlanta, Ga., 5-21-41, P. W. Fattig (USNM); Atlanta, Ga., 5-22-41, P. W. Fattig (2♀, USNM); Lakemont, Ga., 6-5-40, P. W. Fattig (2♀, USNM); Neel Gap, Ga., 6-4-51, P. W. Fattig (2♀, CHT); Ranger, Ga., 5-25-50, P. W. Fattig (CHT); ILL.: DuPage Co., Argonne Natl. Lab., at light, 1-VII-1967, leg. J. Wagner & W. Suter, 1967 AMU-ANL Ecological Survey (USNM); Principia College, Elsah, Jersey Co., Ill., V-26-41, C. L. Remington (USNM); Plummers I., Md., 6-27-38, A. B. Gurney (USNM); Oxford, Miss., 5-15-1949, H. V. Weems, Jr. (USNM); Dean For., O., 5--'41, C. R. Neiswander, Collr. (CHT); Highlands, N. C., 31-V-1957, W. R. M. Mason (CNC); Highlands, N. C., 19-VI-1957, W. R. M. Mason (CNC); Sylva, N. C., VI-7-47, H. Townes (CHT); Springfield, Del. Co., Pa., 6-VI-1934, H. P. Hopper, woodland (HPH); Cleveland, S. C., VI-1-1961, G. F. Townes (CHT); paratype: ♂, Alt. 2500', Gr. Smoky Mt. Nat. Pk., Tenn., V-8-1955, H&A Howden (CHT).

### The Hyalinis Group

In this group, the diameter of the lateral ocelli is equal to or less than the ocellocular line, the mesoscutum and mesopleurum have moderately to rather deep punctures of medium size separated by more than one-half their diameter but appearing moderately dense, epomia with a smooth curve that becomes almost perpendicular to the collar below, enclosing a space of medium size, notauli broad and shallow but distinct, especially broad where they meet margin of mesoscutum, petiolar area with transverse rugulae predominating (there are usually only transverse rugulae in hyalinis, sometimes also in gracilis, sometimes last few in edemae). The species included are gracilis, hyalinis, edemae, and politus.

### 2. Aphanistes gracilis, new species

Female: Forewing 6.4--11.4 mm, body 10.8--19.5 mm; antenna 7.5--15 mm, 37--47 segments, first flagellar segment 5.81--6.5 times as long as wide, combined length of second and third segments 0.9--1.01 times first; head thickness-width ratio 1.63--1.66, head length-width ratio 1.176--1.213, head thickness-camber ratio 3.6--3.7, occipital camber 3.9--4.4, head-occiput width ratio 1.397--1.52, eye-temple ratio 2.1--2.5; mesoscutum index 1.2--1.35, head width 1.6375--1.64 times mesoscutum width, scutellum 1:1.08--1.2:0.59--0.6; depth:width:length of propodeum 1:1.025--1.08:1.175--1.2; hindbasitarsus 12.25--15.6 times as long as thick, first tergite 1.07--1.12 times as long as hindbasitarsus; width of postpetiole 0.48--0.565 times length, first tergite 3.6--3.74 times as long as postpetiole.

Habitus moderately slender. Head above and thorax including scutellum rather closely, moderately deeply punctate, subopaque; head moderately strongly convergent behind, relatively thin from front to back, temple rather flat, cheek moderately narrow, median field of face with longitudinal wrinkles.



Notauli broad and shallow but distinct, especially broad where they meet anterior margin of mesoscutum; scutellum slightly elevated at anterior margin, elevation rounded, one-fourth length of scutellum, but disc rather flat to very slightly depressed otherwise. Sides of propodeum very weakly convex; areolation mostly indistinct because of extensive rugulosoreticulation, lateral and median longitudinal carinae present at area dentipara and areola, latter usually open behind. Postpetiole little wider than petiole, its depth at spiracles equal to its maximum width. Hindfemur slender.

Antenna fulvous; face and clypeus except apical tooth, mandible except tip, scape, orbital spot, all tarsi, fore- and midtibiae entirely, base of hindtibia, forecoxa, mid- and hindcoxae below, fore- and midtrochanters, propleurum, collar, usually mesopleurum in part (especially around prepectus), often scutellum in part, and tinge on metapleurum, yellow; black are: tip of mandible, temple, frons and vertex largely, occiput, pedicel, and base of first flagellar segment above, usually broad longitudinal stripe along midline of mesoscutum, often parapsides (but not anterior ends of notauli), patch before and side of scutellum, usually marks on mesopleurum and mesosternum (these sometimes almost entirely black), usually spot at base of propodeum (sometimes entire dorsum), usually metakatepisternum, usually upper surface of hindcoxa, and always about apical third of hindtibia; sometimes spot at base of disc of scutellum, first tergite extensively, and hindtrochanters above piceous (last-named often black); tooth of clypeus piceous.

Male: Forewing 7.55--11.12 mm, body 14.3--22 mm; antenna 12.9--14.9 mm, 40--45 segments (the smallest specimens lack complete antennae), first flagellar segment 4.6--6.0 times as long as wide, combined length of second and third segments 0.98--1.19 times first; head thickness-width ratio 1.62--1.73, head length-width ratio 1.14--1.17, head thickness-camber ratio 3.8--5.25, occipital camber 4.8--6.375, head-occiput width ratio 1.35--1.46, eye-temple ratio 2.44--2.95; mesoscutum index 1.26--1.325, head width 1.5--1.53 times mesoscutum width, scutellum 1:1.18--1.3:0.526--0.69; depth: width:length of propodeum 1:1.0--1.1:1.08--1.25; hindbasitarsus 8.8--9.6 times as long as thick, first tergite 1.14--1.21 times as long as hindbasitarsus; width of postpetiole 0.46--0.55 times length, first tergite 3.4--3.8 times as long as postpetiole.

Sculpture essentially as in female. Color similar to that of female, but with mesopleurum more extensively yellow; tergites 6--8 and clasper often black or piceous (even in one specimen with otherwise greatly reduced black markings).

Material examined: 67♀♀, 30♂♂.

Type: ♀, Takoma Pk., Md., VII-1, 1943, H. & M. Townes (CHT); allotype: ♂, Takoma Pk., VII-2, 1944, H. & M. Townes (CHT); paratypes: ♀♀, Hartford, Conn., 29-VI-1966, G. H. Heinrich (HPH); Voluntown, Conn., Aug. 19, 1951, H. & M. Townes (CHT); Washington, D. C., 12-IX-1942, H. P. Hopper (2♀, HPH); Wash., D. C., 7-11-43, M. Ng [remainder illegible] (USNM); Washington, D. C., VI-19-44 (UCD); Washington, D. C., 8-IX-1957, H. P. Hopper (HPH); Iowa City, Iowa, IX-4-44, RTMitchell, Collector (2♀, RTM); Patuxent Ref., Bowie, Md., 11-IX-1946, RTMitchell, Collector (RTM); Plimmers Isl., Md., 27-IX-1949, G. E. Shewell (CNC); Takoma Pk., Md., VIII-30, 1942, H. & M. Townes (CHT); Takoma Pk., Md., VI-20, 1943, H. & M. Townes (3♀, CHT); Takoma Pk., Md., VI-27, 1943, H. & M. Townes (CHT); Takoma Pk., Md., VII-1, 1943, H. & M. Townes (3♀ in addition to type, CHT); Takoma Pk., Md., IX-11, 1943, H. & M. Townes (3♀, CHT); Takoma Pk., Md., VIII-15-1945, H. & M. Townes (CHT); Takoma Pk., Md.,



VIII-27-1945, H K Townes (CHT); Takoma Pk., Md., VII-5, 1947, H. & M. Townes (2♀, CHT); Colrain, Mass., VIII-17-35, H. D. Pratt (USNM); Fitchburg, Mass., VII-5-37, M. Chapman (CHT); Winchendon, Mass., July 2, 1892 (USNM); Alger Co., Mich., VIII-7-59, R. & K. Dreisbach (Dreisbach); Pelham, N. H., IX-5-1905, Bridwell, Collector (USNM); Pinkham Notch, N. H., Aug. 24 '51, HM&D Townes (CHT); Moorestown, N. J., 13-VIII-1939, H. P. Hopper (HPH); Greene Co., N. Y., Aug. (Pittsburgh); Hancock, N. Y., Aug. 10 1935, H. K. Townes (2♀, CHT); Hancock, N. Y., Aug. 12 1935, H. K. Townes (CHT); Ithaca, N. Y., 30 Aug. 35 (CHT); Oliverea, N. Y., Catskills, IX, 3--8 '18 (USNM); Saranac Lake, N. Y., 30-VI '46, RTMitchell, Collector (RTM); Saranac Lake, N. Y., 9-VII '46 RTMitchell, Collector (RTM); Crabtree MdsNC, Yancey Co. 3600', Aug 21, 1950, HMD&J Townes (CHT); Hamrick NC, Aug 19 '50, HM&D Townes (CHT); Hamrick NC, Aug 28 '50, HM&D Townes (CHT); Philadelphia, Pa., VI-24, 1941, H. & M. Townes (CHT); Wissahickon Val., Philadelphia, Pa., 12 Oct., 1938, H. P. Hopper (HPH); Spring Brook, Pa., Aug. 13 '44, H. K. Townes (CHT); Spring Br Pa, VIII-27-1945, H K Townes (CHT); Ex Hadena turbulenta, Westerly, R. I., VIII-19-27, GipMothLab 12435 M. 1 (USNM); Westerly, R. I., Aug. 20, 1951, H. & M. Townes (CHT); Bolivar, W. Va., Sept. 20, 1942, H. K. Townes (2♀, CHT); Bolivar, W. Va., Sept. 22, 1942, H. K. Townes (2♀, CHT); Bolivar, W. Va., Sept. 23, 1942, H. K. Townes (5♀, CHT); Bolivar, W. Va., Sept. 24, 1942, H. K. Townes (2♀, CHT); Bolivar, W. Va., Sept. 25, 1942, H. K. Townes (2♀, CHT); Bolivar, W. Va., Sept. 26, 1942, H. K. Townes (2♀, CHT); Loc. Restigouche Co., N. B., Host. Semiothisa granitata, Rec. (K) F. I. Survey 1949, Em Mar 13, 1950 "Aphanistes sp. Det. R. S. Forbes," 61P3, F. B. Lab, F.Con.N.B., F.I.S. (CNC); paratypes: ♂♂, Iowa City, Iowa, IX-4-44, RTMitchell, Collector (2♂, RTM); Patuxent Ref., Bowie, Md., 9-VIII-1948, RTMitchell, Collector (RTM); Patuxent Ref., Bowie, Md., 13-IX-1948, RTMitchell, Collector (RTM); Takoma Pk., Md., VI-17, 1942, H. & M. Townes (CHT); Takoma Pk., Md., VI-20, 1943, H. & M. Townes (CHT); Takoma Pk., Md., VII-18, 1943, H. & M. Townes (CHT); Takoma Pk., Md., VIII-25, 1943, H. & M. Townes (CHT); Takoma Pk., Md., IX-7, 1943, H. & M. Townes (CHT); Takoma Pk., Md., IX-9, 1943, H. & M. Townes (CHT); Takoma Pk., Md., VII-5, 1947, H. & M. Townes (CHT); Alger Co. Mich., 7-31-46, R. R. Dreisbach (Dreisbach); Aurelius, Mich., 20 Sept 1938 (MSEL); Huron Mts., Mich., July 30, 1959, Henry Townes (CHT); Pinkham Notch, NH, Aug. 25 '51, HM&D Townes (CHT); Greene Co., N. Y., Aug. (Pittsburgh); Flat Rock, N. C., VIII-28-39, H&M Townes (CHT); Ex Hadena turbulenta, Westerly, R. I., VIII-22-27, GipMothLab 12435 M 1 (USNM); Westerly, R. I., Aug. 13, 1951, H.&M. Townes (CHT); Westerly, R. I., Aug. 20, 1951, H.&M. Townes (CHT); Arlington, Virginia, 14 October 1950, J. G. Franclemont (CHT); Bolivar, W. Va., Sept. 22, 1942, H.K. Townes (2♂, CHT); Bolivar, W. Va., Sept. 23, 1942, H.K. Townes (4♂, CHT); Knowlton, Que., 20-VII-1936, G. S. Walley (CNC); Knowlton, Que., 25-VII-1936, G. S. Walley (CNC).

Hosts: Noctuidae: Hadena turbulenta; Geometridae: Semiothisa granitata.

### 3. Aphanistes hyalinis (Norton)

Anomalon hyaline Norton, 1863. Ent. Soc. Phila., Proc. 1: 361.

Type: ♀, Farmington, Conn. (in Peabody Museum, Yale University, New Haven, Connecticut).



Female: Forewing 6.9--12.2 mm, body 11.85--21.1 mm; antenna 11.5--14 mm, 43--47 segments (antennae lacking in smallest specimens); first flagellar segment 4.2--5.5 times as long as wide, combined length of second and third segments 0.89 (large specimens)--1.07 (smallest specimen) times first; head thickness-width ratio 1.575--1.8, head length-width ratio 1.1--1.2, head thickness-camber ratio 3.5--4.2, occipital camber 4.1--5.2, head-occiput width ratio 1.325--1.5, eye-temple ratio 1.6--2.0; mesoscutum index 1.15--1.275, head width 1.425--1.58 times mesoscutum width, scutellum 1:0.8--1.15:0.55--0.7; depth:width:length of propodeum 1:1.05--1.2:1.15--1.45; hindbasitarsus 9.0--11.0 times as long as thick, first tergite 1.05--1.25 times as long as hindbasitarsus; width of postpetiole 0.4--0.75 times length, first tergite 3.4--4.7 times as long as postpetiole.

Habitus moderately slender (usually slightly less so than in *gracilis*). Face rather finely densely punctate (punctures separated by one-half to one time diameter), very shallowly laterally, more deeply (moderately shallowly) toward midline, usually becoming vertically rugulose or wrinkled (about four wrinkles) in mesal one-fourth (if wrinkles are weak or absent, there is a low rounded vertical (longitudinal) prominence extending from subantennal carina to base of clypeus); gena with rather close, shallow punctures below (one-half or less their diameter apart), becoming sparser toward middle (separated by one to two times their diameter), and becoming denser again on the rather flat temple and much deeper without a change of size on stemmaticum; vertex behind ocelli closely deeply punctate with a slight tendency for punctures to run together to form rugulae between; cheek in profile at least twice as wide as temple, lower posterior corner usually distinctly below inner/upper angle of mandible when long axis of head vertical; frons distinctly rugulose except more or less laterally (sometimes only orbits, sometimes wider area); ocellocular space with only a few shallow punctures, interocellar line 1.125 times ocellocular line, head moderately convergent behind. Pronotum rather densely punctate, with punctures running together in the trough to form rugulae between; mesopleurum and mesoscutum rather closely moderately deeply punctate, subopaque; notauli distinct, rather broad and shallow, with an irregular line of punctures rather than a groove, widening into a broad cove without a distinct line at about one-fourth length of mesoscutum from anterior margin; epomia distinct, curving toward collar rather sharply at the outer (lower) end and curving slightly in the opposite direction at upper (inner) end (not directed toward anterior margin of pronotum), length from outer end to midline 0.7--0.8 times distance from outer end to margin of pronotum, enclosed space with indistinct sculpture, width about 0.46 times width of adjacent collar; mesoscutum and mesopleurum rather densely punctate, punctures rather small and moderately deep, separated by less than one-half their diameter; black area of mesoscutum in front of scutellum less distinctly transversely rugulose than usual in the genus, in some specimens rather rugulosopunctate; scutellum more or less elevated, usually with distinct lateral carina, disc less closely punctate than mesoscutum, punctures slightly larger, center of disc often subpolished to polished, usually with more or less distinct median longitudinal indentation and rather rounded at apex; speculum represented only by a slight elevation with only a narrow anterior edge polished; sternaulus distinct, short, about two-fifths length of mesopleurum, but usually not sharply impressed. Propodeum subpolished with only very minute indistinct punctures except in areola and area dentipara (latter usually not separated from first lateral area), where they are shallow and very closely placed and tend to appear as fine reticulations; areola between square and pentagonal, sometimes separated from the petiolar area only by a



difference in sculpture, sometimes more or less distinctly closed behind; area dentipara (including first lateral area) occupying two-fifths length of propodeum, when partially separated from first lateral area, area dentipara tetragonal, almost an irregular triangle, adjacent portion of paracostula more or less straight and at about  $45^{\circ}$  to midline, lateral longitudinal carina particularly strong at this point; sides of propodeum rather bulging, pleural carina usually indistinct or obsolete, weaker than any longitudinal ruga on metapleurum and near bottom of propodeal fossa; petiolar area and third lateral area usually with (rather straight) transverse rugae only. Hindfemur slightly stout. Petiole and postpetiole not or little deeper than wide, never widened, postpetiole subelliptical to subcompressed.

Antenna dark fulvous to fuscous; head yellow except clypeal tooth fulvous and tip of mandible, frons, stemmaticum, vertex (with usual yellow orbital spots), and temple (ferruginous behind orbital spot in type), and upper part of occiput, which are black. Thorax, propodeum, and abdomen luteous or dull fulvous (thorax and propodeum often with yellow-tinged areas; in one specimen thorax and propodeum wholly yellowish except narrow piceous to black median line on mesoscutum) with black longitudinal stripe on mesoscutum, sometimes confluent with the black patch before scutellum, and with more or less piceous on parapsides, extending forward from the black patch (rarely mesoscutum almost entirely black except anterior ends of notauli); spot below forewing, mesosternum (extending above sternaulus), areola, and area dentipara normally black, metanepimerum usually more or less piceous or black, metasternum rarely black (only one such specimen seen, a few have limited piceous area directly above coxa); side of scutellum (black in most other species) usually yellow or with only a black spot, at least upper anterior corner yellow; rarely apex of disc of scutellum black, still more rarely also blotch at base and median longitudinal streak piceous to black. Wings hyaline to subhyaline. Fore- and midlegs yellow except sometimes tips of tarsi and often femora and coxae more or less fulvous, midcoxa never infusate below; hindtarsus and approximately proximal two-fifths of hindtibia yellow, remainder of tibia black, hindfemur fulvous or sometimes ferruginous or rarely brown above, hindtrochanters and hindcoxa largely black. Postpetiole or sometimes entire first tergite usually piceous to black, commonly lighter anteriorly (in small specimens only infusate or entire segment fulvous); venter of first two to four abdominal segments usually black, also portions of the last two or three tergites sometimes piceous to black; dorsum of second tergite largely black with luteous lateral margins.

Male: Forewing 7.6--11.4 mm, body 13.3--21.7 mm; antenna 8.7--14.1 mm, 35--45 segments, first flagellar segment 4.9--5.5 times as long as wide, combined length of second and third segments 0.93--1.15 times first; head thickness-width ratio 1.6--1.7, head length-width ratio 1.14--1.2, head thickness-camber ratio 3.65--3.75, occipital camber 4.3--4.45, head-occiput width ratio 1.35--1.4, eye-temple ratio 1.67--1.78; mesoscutum index 1.16--1.275, head width 1.40--1.43 times mesoscutum width, scutellum 1:0.9--0.975:0.6--0.7; depth:width:length of propodeum 1:1.075--1.175:0.975--1.16; hindbasitarsus 8.0--11.0 times as long as thick, first tergite 0.97--1.15 times as long as hindbasitarsus; width of postpetiole 0.45--0.625 times length, first tergite 3.3--3.9 times as long as postpetiole.

Habitus and sculpture generally as in female, with less tendency (in the six specimens examined) to vertical wrinkling in the middle of the face, rather deeper punctures on temple and vertex, and stronger rugulosity on frons. Space enclosed by epomia with weak rugulosity; punctures on meso-



pleurum with rather linear, more or less longitudinal separations (more elevated than separations transverse to the former); rugulosity of space before scutellum more as in other species of the genus; scutellum less polished, but otherwise as in female. Propodeum almost wholly devoid of punctures in the median, lateral, and pleural regions, including the area dentipara and areola--these last instead with some rather distinct rugulae forming some reticulations.

Color as in female except prepectus and portion of mesopleurum immediately behind yellow, and one specimen has entire lower portion of mesopleurum and upper posterior margin of pronotum yellow, remainder of mesopleurum except subalar black spot and entire mesoscutum except black patch before scutellum ferruginous and hindcoxa without black or ferruginous.

Material examined: 26♀♀, 6♂♂.

Distribution: Alaska, Connecticut, Illinois, Maryland, Michigan, New York, Pennsylvania, Virginia, "Collection Belfrage" [Texas?], New Brunswick, Nova Scotia, Ontario, Quebec.

Hosts: Noctuidae: Baileya ophthalmica, Catocala sp.; Notodontidae: Symmerista albifrons, Symmerista canicosta.

#### 4. Aphanistes edemae (Davis)

Anomalon edemae Davis, 1898 (1897). Amer. Ent. Soc., Trans. 24: 360.

♂, ♀ [♂ not examined]. Lectotype: ♀ (designated by Cresson, 1928), Michigan, reared from Edema albifrons (in the Academy of Natural Sciences of Philadelphia, Philadelphia, Pa.).

Female: Forewing 11--13.3 mm, body 18.7--23.7 mm; antenna 12--15.2 mm (only three specimens with complete antennae), 43--48 segments, first flagellar segment 4.0--5.0 times as long as wide, combined length of second and third segments 0.85--1.0 times first; head thickness-width ratio 1.625--1.675, head length-width ratio 1.13--1.275, head thickness-camber ratio 3.4--4.6, occipital camber 3.8--5.5, head-occiput width ratio 1.29--1.4, eye-temple ratio 1.5--1.9; mesoscutum index 1.186--1.275, head width 1.27--1.4 times mesoscutum width, scutellum 1:0.8--0.9:0.5--0.6; depth:width:length of propodeum 1:1.037--1.175:1.06--1.125; hindbasitarsus 8.15--10.86 times as long as thick, first tergite 1.02--1.2 times as long as hindbasitarsus; width of postpetiole 0.4--0.6 times length, first tergite 2.575--3.477 times as long as postpetiole.

Habitus slightly stout, especially thorax. Clypeus and face in profile form rather straight, nearly unbroken line with inconspicuous dividing furrow; face with rather dense, somewhat shallow punctures, usually forming a few low longitudinal wrinkles on the median field just below subantennal carina; frons rugulose, stemmaticum rugulosopunctate, vertex rather densely deeply punctate, ocellocular space with very few small shallow punctures, interocellar line 1.14 times ocellocular line; gena with rather small dense punctures, rather shallow below, but becoming rather deep on temple, temple rather bulging (except in type, in which temple only moderately convex). Pronotum, mesoscutum, and mesopleurum moderately finely closely deeply punctate, punctures separated by one-half their diameter or less, those on pronotum and mesopleurum often partially running together to become rugulosopunctate, but without really distinct rugulae; epomia enclosing moderately large space, length from mesal line 0.65 times distance from outer end to lateral margin of pronotum; notauli rather broad and deep, without a furrow (which is replaced by very closely



spaced punctures not in a smooth line); sternaulus broad and shallow without a distinct furrow; speculum obscure, mesopleural impression indistinct; scutellum somewhat elevated, usually with a weak median longitudinal impression, lateral carina from moderately distinct to obsolete, punctation rather uniform and pretty much like mesoscutum; transverse rugulae in front of scutellum very fine but distinct. Propodeum subopaque with very fine shallow indistinct punctures throughout--slightly deeper and more distinct in areola (which is not closed behind) and area dentipara and usually more or less distinctly separated first lateral area, area dentipara frequently containing some supplementary rugulae; areola more or less hexagonal; third lateral area with only transverse rugulae, separated from petiolar area, which has chiefly only transverse ridges caudad, but some irregular rugulae with other orientations anteriorly; area dentipara extending from two-fifths to slightly more than half length of propodeum; pleural carina distinct, usually stronger than any ruga on metapleurum, situated ventrolaterad from bottom of propodeal fossa. Postpetiole deepened, subcompressed, entire first tergite usually distinctly deeper than wide except in type and one other specimen, in which the portion of postpetiole adjacent to spiracles and the apical half of petiole are abnormally enlarged, both deepened and widened, upper surface of postpetiole strongly arched in all specimens. Hindfemur stout.

Antenna fuscous to piceous; head yellow except tip of mandible, temple, frons and vertex (except orbital spots--sometimes very small), upper side of scape and pedicel, and upper half of occiput black. Mesosternum and medial portion of mesoprescutum and parapsides black, latter interconnected by usual black area before scutellum, black on mesoscutum often more extensive, only lateral margins (extending slightly into anterior ends of notauli) always dull fulvous or luteous; mesopleurum from wholly dull fulvous to almost wholly black with only sutures and mesopleural impression dull fulvous; scutellum with disc from wholly black to dull fulvous with only small basal and apical black marks, side of scutellum usually black, but a few specimens have side fulvous with only small black spot in upper anterior corner; collar dull fulvous as is also mesal part of pronotum and often entire pronotum, or latter may be black. Metanotum dull fulvous except usually postscutellum and metanepimerum black. Propodeum with first lateral area, area dentipara, basal area, areola, and most of petiolar area black; metapleurum (except sometimes part of metakatepisternum next to coxa) fulvous. Fore- and midlegs yellow except femora more or less fulvous, forecoxa with black spot and midcoxa largely black (usually infuscated to black beneath); hindcoxa usually wholly black, hindtrochanters usually almost wholly black; hindfemur dark brown or piceous at least above; hindtibia yellow at base, black at apex; hindtarsus yellow. Wings usually moderately infusate, occasionally subhyaline. First tergite wholly black or piceous, as is second including lateral margins, remainder of abdomen wholly piceous except hypopygium and ovipositor sheath fulvous (except that in type tergites 3--5 dull fulvous, 6--7 black above).

Male: Forewing 10.8--12.4 mm, body 19.8--24.3 mm; antenna 13.1 mm (only one specimen--not largest or smallest--with complete antennae), 42 segments, first flagellar segment 4.1--4.8 times as long as wide, combined length of second and third segments 0.95--1.1 times first; head thickness-width ratio 1.64--1.75, head length-width ratio 1.15--1.25, head thickness-camber ratio 3.0--3.45, occipital camber 3.7--4.6, head-occiput width ratio 1.275--1.425, eye-temple ratio 1.45--1.9; mesoscutum index 1.14--1.25, head width 1.24--1.38 times mesoscutum width, scutellum 1:0.8--1.25:0.45--0.8; depth:width:length of propodeum 1:1.0--1.325:1.0--1.325; hindbasitarsus 7.3--



8.9 times as long as thick, first tergite 1.06--1.22 times as long as hindbasitarsus; width of postpetiole 0.45--0.6 times length, first tergite 2.7--3.5 times as long as postpetiole.

Habitus and sculpture as in female. Color as in female with slightly higher incidence of fulvous on thorax, often including wholly fulvous scutellum without darker marks; one specimen also has fore- and midcoxae wholly yellow.

Material examined: 10♀♀, 13♂♂.

Distribution: Maine, Massachusetts, Michigan, Missouri, New Jersey, New York, North Carolina, Ontario, Pennsylvania, Quebec, South Carolina, Virginia.

Hosts: Notodontidae: Datana contracta, Datana integerrima, Datana ministra, [?] Edema albifrons [=Symmerista a. ?].

##### 5. Aphanistes politus, new species

Female: Forewing 5.6--7.15 mm, body 9.4--11.7 mm; antenna 5.5--8.0 mm, 31--36 segments, first flagellar segment 5.58--5.89 times as long as wide, combined length of second and third segments 1.0--1.014 times first; head thickness-width ratio 1.55--1.596, head length-width ratio 1.085--1.112, head thickness-camber ratio 3.3--4.3, occipital camber 3.68--5.16, head-occiput width ratio 1.36--1.42, eye-temple ratio 2.25--2.83; mesoscutum index 1.097--1.21, head width 1.46--1.57 times mesoscutum width, scutellum 1:1.0--1.1:0.5--0.8; depth:width:length of propodeum 1:1.08--1.12:1.16--1.36; hindbasitarsus 6.2--10.75 times as long as thick, first tergite 1.25--1.5 times as long as hindbasitarsus; width of postpetiole 0.5--0.56 times length, first tergite 3.43--3.56 times as long as postpetiole.

Habitus medium slender. Head above in general highly polished with scattered small weak punctures, rather strongly narrowed behind, temple flattish; frons and vertex rather distinctly convex, especially stemmaticum, which is weakly rugulosopunctate, ocellocular space rather large, punctures inconspicuous except at about 30x. Face projecting between eyes (in profile, the far eye disappears considerably before it comes in line with the near one); midpoint of occipital carina (viewed in plane of occiput) in the line between upper rear inner corners of eyes. Pronotum, mesoscutum, mesopleurum, and scutellum moderately densely shallowly punctate, polished, punctures separated by one-half their diameter or less; notauli rather strongly sharply impressed, prescutum slightly raised above parapsides, angle between notauli 15°--25°; scutellum with fully developed lateral carina, anterior margin rather angular but without evident carina; space enclosed by epomia shortish, narrow, tapered below, approximately twice thickness of the carina. Propodeum rugose with lateral longitudinal and median longitudinal carinae distinct; area dentipara (coalesced with first lateral area) distinctly bounded; petiolar area broad, moderately excavated, with tendency to transverse rugulae; pleural carina indistinct, propodeal fossa very shallow. Hindfemur moderately stout. First tergite slightly to distinctly wider than deep, flattish above, more or less distinctly elevated before spiracles, widening gradually in posterior half or third before spiracles, postpetiole distinctly wider than petiole; abdomen rather long and slender; length of ovipositor about 1.25 times depth of apex of abdomen, distinctly slightly decurved from anterior end of nodus.

Fulvoferruginous; antenna fulvous (sometimes slightly darker); head (except tip of mandible, stemmaticum, and upper part of occiput black), forecoxa and -trochanters, posterior face of foretibia, all tarsi, scutellum (except side and



apical edge black), lower surfaces of hindtrochanters, and sometimes inner surface of hindtibia yellow; collar yellow or fulvous; in addition to areas already mentioned, the following black: spot on mesoscutum before scutellum, usually spot under wings, upper surfaces of hindcoxa and hindbasitrochanter (the last two sometimes piceous), dorsum of second tergite (except lateral margins), sometimes longitudinal line on mesoscutum (joining prescutellar patch), often mark at base of propodeum, often upper surface of hinddistitrochanter, metanotum and metanepimerum more or less, often splotches near apex of abdomen, rarely mesosternum, and in one specimen upper surface of propodeum entirely and first tergite (perhaps shellac); first tergite otherwise sometimes slightly infusate to piceous. Coloring of hindtibia exceptional: black at apex spreading toward base on outer side, becoming progressively piceous and ferruginous, never yellow on outer surface, rarely yellowish at base, about one-third of circumference on inner surface at base usually yellow. Wings hyaline to subhyaline.

Male: Forewing 5.26--6.4 mm, body 9.0--12.0 mm; antenna 6.5--7.5 mm, 32--35 segments, first flagellar segment 5.96--6.09 times as long as wide, combined length of second and third segments 1.0--1.07 times first; head thickness-width ratio 1.56--1.6, head length-width ratio 1.112--1.125, head thickness-camber ratio 4.3--4.4, occipital camber 3.68--5.17, head-occiput width ratio 1.37--1.396, eye-temple ratio 2.85--3.28; mesoscutum index 1.06--1.26, head width 1.5--1.66 times mesoscutum width, scutellum 1:1.1--1.2:0.6--0.7; depth:width:length of propodeum 1:1.08--1.125:1.25--1.26; hindbasitarsus 4.6--6.25 times as long as thick, first tergite 1.5--1.83 times as long as hindbasitarsus; width of postpetiole 0.53--0.65 times length, first tergite 3.6--4.2 times as long as postpetiole.

Sculpture generally as female. First tergite as in female except petiole flattish dorsally, but not wider than deep. Color generally as in female with additional yellow spots at lower edge of prepectus and on mesopleurum at base of midleg; midcoxa, all trochanters except upper surface of hindtrochanters, and lower surface of hindcoxa, yellow. Black at apex of scutellum more extensive and apex of abdomen usually black including clasper.

Material examined: 18♀♀, 10♂♂.

Type: ♀, Ann Arbor, Mich., Trap, VI-6 '63, H. & M. Townes (CHT); allotype: ♂, Westmoreland St. Pk., Westmoreland Co., Va., 6 July 1951, Karl V. Krombein (CHT); paratypes: ♀♀, Takoma Pk., Md., VI-20, 1943, H. & M. Townes (CHT); Moorestown, N. J., July 16, 1939, H. & M. Townes (CHT); Bemus Pt., N. Y., Jul. 17, 1937, H. K. Townes (CHT); Farmingdale, N. Y., Jul. 2 '38, H. & M. Townes (2♀, CHT); Farmingdale, N. Y., Jul. 3 '38, H. & M. Townes (2♀, one CHT, one HPH); Ithaca, N. Y., 17 VIII-47 (CNC); Poughkeepsie, N. Y., Jl. 6 1936, H. K. Townes (CHT); Poughkeepsie, N. Y., Jl. 18 1936, H. K. Townes (CHT); Baddeck Forks, N. S., 9-VII-1926, T. N. Freeman (CNC); Ottawa, Ont., 27 VII 1947, W. R. M. Mason (CNC); Crisp, Pa., C. M. Acc. 321, July (2♀, Pittsburgh); Westm'nd Co., Pa., July (2♀, Pittsburgh); Youngwood, Pa., V-29-41, H. K. Townes (CHT); paratypes: ♂♂, Takoma Pk., Md., VI-15, 1943, H. & M. Townes (CHT); Takoma Pk., Md., VI-20, 1943, H. & M. Townes (CHT); Takoma Pk., Md., VI-24, 1943, H. & M. Townes (CHT); Ionia Co., Mich., R. & K. Dreisbach (Dreisbach); Randolph, N. H., July 2, 1946, J. Peck & M. Townes (CHT); New Brunswick, N. J., VI-29 (USNM); Buffalo, N. Y., 4 July '33, Krombein Coll. (USNM); Farmingdale, N. Y., Jul. 3 '38, H. & M. Townes (CHT); Ithaca, N. Y., Jun. 28, 1937, H. K. Townes (CHT).



## The Nigrorufus Group

This group has ocelli of normal size for the genus, diameter of lateral ocellus equal to or less than ocellocular line; top of head moderately densely punctate (punctures separated by about their diameter) all over except in the rather small orbital spot, punctures moderately large and deep; frons often slightly depressed, stemmaticum not or scarcely raised above the surrounding parts, temple usually moderately to strongly bulging, so that head more or less buccate; mesoscutum and mesopleurum densely punctate, punctures from moderate in size and depth to strong and deep; epomia enclosing space of moderate size, sometimes somewhat narrow, usually quite distinct, sometimes bounded by a number of rather weak rugulae instead of a carina, lower end of epomia not nearly perpendicular to collar; notauli from somewhat sharply impressed (but not deep, and consisting of a line of punctures rather than a groove) to diffuse and barely distinct or wide and rounded (approaching the preceding group) to flat and distinguished only by a line of punctures of different size and depth from the adjacent ones; propodeum from neither broad nor long to slightly broad, rugosity and carinae rather strong, sides slightly to moderately bulging, petiolar area rarely with transverse rugae predominant; hindfemur sometimes somewhat incrassate, hindtarsus rather long and slender. Postpetiole usually elliptical in cross section, slightly deeper than wide, first tergite usually infusate to piceous. Species included are coxatus, nigrorufus, and townesi.

6. Aphanistes coxatus, new species

Female: Forewing 7.7--10.8 mm, body 13.6--21.2 mm; antenna 8.4--11.5 mm (the two specimens with longest forewings and the one with longest body lack complete antennae), 39--46 segments, first flagellar segment 4.1--4.9 times as long as wide, combined length of second and third segments 0.83--0.878 times first; head thickness-width ratio 1.59--1.78, head length-width ratio 1.12--1.27, head thickness-camber ratio 3.0--3.95, occipital camber 3.9--5.35, head-occiput width ratio 1.213--1.25, eye-temple ratio 1.3--1.7; mesoscutum index 1.15--1.24, head width 1.3--1.36 times mesoscutum width, scutellum 1:0.9--1.15:0.55--0.7; depth:width:length of propodeum 1:1.04--1.2:1.04--1.18; hindbasitarsus 9.1--10.88 times as long as thick, first tergite 1.13--1.32 times as long as hindbasitarsus; width of postpetiole 0.49--0.8 times length, first tergite 3.04--4.2 times as long as postpetiole.

Habitus slightly stout. Face in profile slightly prominent, rather smoothly curved, in front view somewhat narrow and a little more than usually convergent below, closely finely rather deeply punctate, punctures tending to line up to form longitudinal wrinkles; clypeus, especially in Canadian specimens, with somewhat smaller and more numerous punctures in the central area than usual in our species; temple rather strongly and deeply punctate, cheek more sparsely and shallowly (but more closely and deeply than in other species of the genus, especially those of other species groups), the occipital carina strongly convergent toward base of mandible from the middle of the eye, its line straightish to slightly recurved and with rather abrupt change of direction at midlength of the eye; frons and vertex rather strongly to very strongly deeply punctate or rugulosopunctate. Thorax moderately (New Jersey specimens) to very (Canadian specimens) strongly deeply moderately closely punc-



tate, in Canadian specimens with considerable development of rugulosity, especially beneath forewing and at anterior margin of mesopleurum; epomia distinct, enclosure about one-third length of margin of pronotum, less than one-half as wide as long; prepectus in Canadian specimens rather highly polished with little interior sculpture and with distinct carina, in New Jersey specimens depressed area opaque and only slightly less closely punctate than mesopleurum and carina more or less indistinct; speculum with only very small polished area; scutellum moderately elevated, anterior margin abrupt or somewhat rounded, highest at one-fifth to one-fourth length, upper surface flat to slightly depressed, closely and strongly punctate with very strong lateral carina (often a double line with a narrow space between on each side, the inner stronger) and anterior transverse carina in Canadian specimens, obsolete (most distinct in location of outer row of Canadian specimens) in New Jersey specimens; notauli distinct but broad and shallow, prescutum little elevated above parapsides; sternaulus strongly impressed, extending beyond midlength of mesopleurum. Propodeum coarsely rugose with only faint sculpture in the spaces; area dentipara rather distinct, usually at least partially separated from first lateral area; all longitudinal carinae more or less distinct. Forecoxa rather strongly flattened in apical ventral two-thirds, flattened area bounded proximally by a distinct narrow rounded oblique ridge (not a carina), higher at its inner (posterior when legs at right angle to midline) end (at the point where some other species have highest point of a rounded conical formation sometimes with a faint suggestion of a ridge, but with the entire ventral surface convexly rounded) with a flattish or cylindrically concave surface proximad. First tergite of Canadian specimens with a median longitudinal (rounded) furrow, usually from near base to near apex, occasionally from just before to just behind spiracles, lacking altogether in New Jersey specimens.

Antenna from dark ferruginous to piceous, with first flagellar segment above, usually also pedicel, sometimes scape above (latter otherwise yellow) black. Head yellow except tip of mandible black, upper one-fourth to two-fifths of gena usually black (brown or with large brown spot in New Jersey specimens); frons, vertex, stemmaticum, and upper part of occiput black except yellow orbital spot (in New Jersey specimens, yellow extends from face along sides of frons and vertex nearly to occipital carina). Mesoscutum usually black except anterior ends of notauli and often lateral edges of parapsides ferruginous; sterna usually wholly black (only black just in front of coxae in New Jersey specimens); spot under forewing black in all specimens, in Canadian specimens mesopleurum more extensively black, sometimes wholly black including prepectus; pronotum from wholly fulvous (strongly tinged with yellow in New Jersey specimens) to almost wholly black; scutellum ferruginous, often with small amount of yellow around edges, rarely with some black toward base, extending caudad medially; thorax otherwise fulvoferruginous. Propodeum with transverse black marks at base of area dentipara (corresponding to first lateral area), small in New Jersey specimens, usually larger in Canadian specimens and extending from side to side, sometimes expanded over almost entire dorsal surface, in which case metakatepisternum also black. First tergite medially infusate in all specimens, rarely with some black; lateral edges of second tergite and remainder of abdomen fulvous. Fore- and midlegs yellow except femora ferruginous, hindtarsus and base of hindtibia yellow, hindtibia apically black, extending well beyond halfway to base on at least one side, hindfemur ferruginous, dorsally infusate. Wings subhyaline, rarely hyaline or slightly infusate.



Male: Forewing 7.8--9.3 mm, body 15.0--17.4 mm; antenna 9.4--10.8 mm, 39--43 segments, first flagellar segment 4.06--4.75 times as long as wide, combined length of second and third segments 1.0--1.05 times first; head thickness-width ratio 1.58--1.74, head length-width ratio 1.12--1.39, head thickness-camber ratio 2.86--3.2, occipital camber 3.97--4.5, head-occiput width ratio 1.16--1.25, eye-temple ratio 1.6--1.8; mesoscutum index 1.1--1.2, head width 1.27--1.41 times mesoscutum width, scutellum 1:0.89--1.15:0.58--0.6; depth:width:length of propodeum 1:1.1--1.19:1.025--1.1; hindbasitarsus 6.625--7.55 times as long as thick, first tergite 1.176--1.396 times as long as hindbasitarsus; width of postpetiole 0.5--0.6 times length, first tergite 3.2--3.58 times as long as postpetiole.

Sculpture and color substantially as in female.

Material examined: 18♀♀, 10♂♂.

Type: ♀, Ex E. crepuscularia, Moffette, Que., Rec. 2208A, F. I. Survey 1940, Em. (Incubator) 19-III 1941 (CNC); allotype: ♂, Ex P. porcelaria, Treesbank, Man., Rec.: 6298A, F. I. Survey 1939, Em. (Incubator) 20-V 1939 (CNC); paratypes: ♀♀, No. 5-1626A, Date 3-II-, F. I. S. 1951, Zale sp., Sinclair, B. C. (CNC); Spruce Woods, Man., May 26, 1939, H. A. Richmond (F. I. S., CNC); Ex P. porcelaria, Treesbank, Man., Rec.: 6298A, F. I. Survey 1939, Em. (Incubator) 20-V 1939 (CNC); Ex P. porcelaria, Treesbank, Man., Rec.: 6298A, F. I. Survey 1939, Em. (Incubator) 22-V 1939 (4♀, CNC); Ex E. crepuscularia, Treesbank, Man., Rec.: 6298A, F. I. Survey 1939, Em. (Incubator) 22-V 1939 (CNC); Wildwood, N. J., 17-VI-1935, L. J. Bottimer (5♀, four HPH, one CHT); Prince Albert S. [=Saskatchewan], Em. 10-3-53, F. I. S: W-2320A, Ex Eufidonia notataria (CNC); Ex F. jocosa, Ct. Labrecque [P.Q.], R.I.F. '40, 4337-A, Em. 26-2-41 (CNC); [no label, but associated in collection with specimen of A. townesi labelled 'W.Was.' without date, but evidently of similar age] (USNM); [also without collection data, with one label 'Anomalon nigro-rufum Nort. ♀' in writing suggesting a date approximately between 1880 and 1910, and a second label 'Anomalon nigro-rufum Nort., C. W. T. Gahan 1920' ] (USNM); paratypes: ♂♂, Rec.: 44-662A, F. I. Survey 1946, Em. (incubator), 11-II-1947, Hazelton, B. C., Phalaenidae [=Noctuidae] (CNC); Spruce Woods, Man., May 16, 1939, H. A. Richmond, F. I. S. Man. 1942-1943 (CNC); Spruce Woods, Man., May 26, 1939, H. A. Richmond, (F.I.S., CNC); Ex P. porcelaria, Treesbank, Man., Rec: 6298A, F. I. Survey 1939, Em. (Incubator) 17-V 1939 (CNC); Ex Anacamptodes sp., Treesbank, Man., Rec: 6298A, F. I. Survey 1939, Em. (Incubator) 20-V 1939 (CNC); Ex P. porcelaria, Treesbank, Man., Rec: 6298A, F. I. Survey 1939, Em. (Incubator) 22-V 1939 (CNC); Ex Zale helata, Angus, Ont., No. 045-521, Date 21-II-46, F. I. S. 1945 (CNC); Ex Zale sp., Pointe au Baril, Ont., 550, No. 3873-01-1, Date 16-III-51, F. I. S. 1950, 5437 (CNC); Rec; 6298, F. I. Survey 1939, Em (incubator), 18-V-1939 (CNC).

Hosts: Geometridae and Noctuidae: Anacamptodes sp., Ectropis crepuscularia, Eufidonia notataria, Feralia jocosa, Protoarmia porcelaria, Zale helata, Zale sp.

#### 7. Aphanistes nigrorufus (Norton)

Anomalon nigro-rufus Norton, 1863. Ent. Soc. Phila., Proc. 1: 361.

Type: ♀, N. Y. (in Peabody Museum, Yale University, New Haven, Connecticut).



**Female:** Forewing 11.03--12.8 mm, body 18.9--22.3 mm; antenna 11.4--12.9 mm (only two specimens with complete antennae), 45--47 segments, first flagellar segment 3.9--5.7 times as long as wide, combined length of second and third segments 0.83--1.04 times first; head thickness-width ratio 1.6--1.7, head length-width ratio 1.14--1.21, head thickness-camber ratio 3.475--4.3, occipital camber 3.65--5.55, head-occiput width ratio 1.23--1.38, eye-temple ratio 1.4--1.75; mesoscutum index 1.2--1.3, head width 1.25--1.5 times mesoscutum width, scutellum 1:1.0--1.15:0.55-0.66; depth: width:length of propodeum 1:1.012--1.125:0.94--1.1; hindbasitarsus 8.0--12.375 times as long as thick, first tergite 0.95--1.125 times as long as hindbasitarsus; width of postpetiole 0.54--0.85 times length, first tergite 3.2--4.2 times as long as postpetiole.

Habitus somewhat stout to moderately slender. Antenna very slightly compressed. Face with a number of vertical wrinkles, moderately closely finely punctate; gena somewhat convergent toward base of mandible, relatively finely sparsely punctate, subpolished; frons and vertex rugulosopunctate to ruguloso-reticulate, rather opaque, sculpture rather coarse, frons slightly concave; eye rather large and prominent. Thorax rather densely deeply punctate, subpolished to rather opaque; notauli indistinct or obsolete, little or not at all impressed, represented chiefly by a closely spaced line of punctures differing from the general punctation, prescutum little elevated above parapsides, often imperceptibly; scutellum usually with very strong lateral carina, disc narrowly squarish, convergent caudad, usually broadly shallowly longitudinally concave (these features present even when lateral carina weak) with large deep moderately close punctures, moderately elevated, highest at one-third to one-half its length from anterior margin; epomia usually quite distinct and a number of rather weak rugulae rather than a carina, enclosure moderately large, rather narrow; sternaulus not longer than one-half length of mesopleurum, little or no rugulosity under forewing, speculum with small subpolished area not particularly less densely punctate than remainder of pleurum. Propodeum without any really distinct areolation, strongly rugose-reticulate with fair amount of faint punctation in spaces, opaque, without distinct propodeal fossa; one specimen has about posterior one-third of what would be petiolar area with curved transverse rugae. Hindfemur at least seven times as long as thick. Postpetiole usually rather elliptical in cross section with long axis vertical.

Antenna fuscous to piceous; head yellow except tip of mandible, temple, frons, stemmaticum and vertex (except orbital spot), and upper part of occiput black. Thorax black except collar, anterior edge of pronotum (sometimes also upper edge), and metanepisternum piceous or rarely dull fulvous (in type, spot on pronotum and spot on collar rufofulvous); apex of disc of scutellum often piceous. Propodeum black except metapleurum from above hindcoxa and pedicel fulvo ferruginous (in type, this area and almost entire metapleurum yellowish rufous). Wings subhyaline. Fore- and midlegs yellow except femora fulvous; hindleg with tarsus and upper two-thirds of tibia yellow, apex of tibia, coxa, and most of upper surface of trochanters black, hindfemur dark brown above. Abdomen fulvo ferruginous, first tergite more or less strongly infusate to piceous above and more or less of upper surface of apical tergites infusate or black.

**Male:** Forewing 7.75--10.35 mm, body 13.8--20.5 mm; antenna 10+ mm (only three specimens, none with complete antennae), 43+ segments (first segment missing in all); head thickness-width ratio 1.59--1.69, head length-width ratio 1.177--1.2, head thickness-camber ratio 2.875--3.95, occipital camber 3.38--4.33, head-occiput width ratio 1.405--1.415, eye-temple ratio



2.0--2.97; mesoscutum index 1.15--1.3, head width 1.36--1.5 times mesoscutum width, scutellum 1:1.0--1.1:0.52--0.55; depth:width:length of propodeum 1:1.15--1.26:1.15--1.23; hindbasitarsus 6.25--10.0 times as long as thick, first tergite 1.05--1.32 times as long as hindbasitarsus; width of postpetiole 0.492--0.646 times length, first tergite 3.48--4.03 times as long as postpetiole.

Habitus, sculpture, and color as in female on the whole. Eye extremely large; scutellum with some lighter markings in the two larger specimens, somewhat polished in the smallest.

Material examined: 11♀♀, 3♂♂.

Distribution: British Columbia, New York, North Carolina, Nova Scotia, Ontario, Quebec, Tennessee.

Hosts: C. [Caripeta] divisata? (Geometridae).

#### 8. Aphanistes townesi, new species

Female: Forewing 5.3--11.88 mm, body (estimated 9.7)--20.55 mm; antenna 5.2--11.5+ (estimated 12.5) mm, 30--39 segments (note that largest specimen has incomplete antennae), first flagellar segment 4.16--5.65 times as long as wide, combined length of second and third segments 0.91--1.09 times first; head thickness-width ratio 1.6--1.7, head length-width ratio 1.14--1.21, head thickness-camber ratio 3.68--5.4, occipital camber 4.56--6.675, head-occiput width ratio 1.3--1.4, eye-temple ratio 1.73--2.7; mesoscutum index 1.05--1.18, head width 1.37--1.56 times mesoscutum width, scutellum 1:0.95--1.15:0.5--0.7; depth:width:length of propodeum 1:1.02--1.2:1.1--1.23; hindbasitarsus 7.4--10.8 times as long as thick, first tergite 0.989--1.21 times as long as hindbasitarsus; width of postpetiole 0.588--0.72 times length, first tergite 3.5--4.0 times as long as postpetiole.

Habitus moderately slender. Antenna rather distinctly compressed, about 1.25 times as deep as wide. Face rather densely finely punctate with few and weak vertical wrinkles; gena rather sparsely finely punctate, more or less polished, temple progressively less punctate and more polished than vertex; frons and vertex rugulosoreticulate or rugulose, sometimes with some areas merely punctate, sculpture rather dense and moderately deep, subopaque, frons slightly concave behind antennae (in addition to the usual antennal scrobes). Mesoscutum and mesopleurum rather finely weakly densely punctate; notauli fairly distinct, varying from shallow, diffuse, and barely distinct (lateral spread less than in hyalinis group) to narrow, shallow, somewhat sharply impressed lines of punctures; maximum width of prescutum greater than that of one of parapsides, prescutum distinctly raised above parapsides; epomia usually single, forming a smooth curve, enclosure usually rather narrow, maximum width usually less than one-half length, without noticeable rugulae within; scutellum flattish, weakly elevated, with a slight rather straight anterior declivity, sometimes with an indistinct median longitudinal depression never extending from side to side, lateral carina weak to indistinct and below upper surface, punctation of disc somewhat sparser, deeper, and larger than on mesoscutum; sternaulus usually distinctly impressed, one-half or more the length of mesopleurum, latter usually with a number of horizontal rugulae beneath wings. Propodeum rather coarsely rugose, rather polished, only area dentipara (not separated from first lateral area) defined, portion of median longitudinal carina bounding these areas and lateral longitudinal carina recognizable, pleural area moderately distinctly impressed (i.e., propodeal



fossa developed), pleural carina usually stronger than others; metapleurum slightly bulging; petiolar area rather distinctly longitudinally depressed. Hindfemur stoutish, about 6.4 times as long as deep. Postpetiole usually rather elliptical in cross section, slightly deeper than wide.

Antenna fuscoferruginous to piceous, scape either wholly yellow or black above. Head yellow except clypeal tooth fuscous, tip of mandible, temple, and upper part of occiput black. Thorax black, with collar and propleurum extensively, parapsides and mesopleurum more or less extensively, disc of scutellum largely (usually with black mark at base), and propodeum largely (except more or less of dorsal surface and sometimes metakatepisternum) fulvous or ferruginous. First tergite usually partly to wholly piceous or black. Legs yellow except fore- and midfemora more or less fulvous, hindcoxa, more or less of hindtrochanters, and tip of hindtibia black, hindfemur fulvoferruginous to ferruginous, often darker above and infusate toward apex. Wings hyaline to lightly infusate, usually subhyaline.

Male: Forewing 5.9--11.3 mm, body 11.35--21.2 mm; antenna 7.4--12 mm, 33--40 segments (largest specimens have incomplete antennae), first flagellar segment 3.88--5.12 times as long as wide, combined length of second and third segments 0.95--1.15 times first; head thickness-width ratio 1.64--1.77, head length-width ratio 1.133--1.358, head thickness-camber ratio 3.05--4.86, occipital camber 3.6--5.86, head-occiput width ratio 1.3--1.4, eye-temple ratio 2.0--2.5; mesoscutum index 1.13--1.26, head width 1.436--1.486 times mesoscutum width, scutellum 1:0.95--1.1:0.5--0.6; depth:width: length of propodeum 1:1.05--1.116:1.06--1.176; hindbasitarsus 5.33--9.5 times as long as thick, first tergite 0.9--1.3 times as long as hindbasitarsus; width of postpetiole 0.548--0.634 times length, first tergite 3.48--3.94 times as long as postpetiole.

Sculpture as in female except punctation of scutellum little different from mesoscutum. Color much as in female, but scutellum always with at least posterior edge black, more usually black with two lateral fulvous or piceous spots or rarely wholly black; sometimes thorax wholly black except tegula, upper anterior and posterior margins of mesopleurum and usually some portion of upper edge of pronotum and a fairly large blotch at base of coxae; propodeum more extensively black: most of dorsum and metakatepisternum always black. Apical tergites of abdomen sometimes black.

Material examined: 8♀♀, 20♂♂.

Type: ♀, Ashford, Wash., Aug. 18, 1940, H. & M. Townes (CHT); allotype: ♂, Ashford, Wash., Aug. 18, 1940, H. & M. Townes (CHT); paratypes: ♀♀, Ex *Nyctobia limitaria*, Athabasca, Alta., No. A 471 C, Date: 13-II-50, F.I.S. 1949 (CNC); No. P49-3634, Date: 13-III-50, F.I.S. 1949, *Hydriomena* sp., Kitwanga R., B.C. (CNC); Wissahickon Val., Philadelphia, Pa., 12 Oct. 1938, H. P. Hopper (HPH); Stoneham, P.Q., June 21, 1938, H. & M. Townes (CHT); Ashford, Wash., Aug. 18, 1940, H. & M. Townes (2♀ in addition to type, CHT); W. Was. (no other data, USNM); paratypes: ♂♂ Blood Mt., Ga., 7-6-51, P.W. Fattig (CHT); Flin Flon, Man., Em. 17-II-47, F.I.S.:W-934, Ex *Carapeta* [sic!] *divisata* (CNC); Waskesiu, Man., Em. 5-3-51, F.I.S:W-4389, Ex *Semiothisa sexmaculata* (F.I.S., CNC); Huron Mts., Mich., July 20, 1959, Henry Townes (CHT); Allarduilie, N.B., Rec: 40-L691A. F.I. Survey 1940, Em. Apr. 13 1941 (CNC); Loc. Sunbury, N.B., Host [blank], Rec: 45 L1084A, F.I. Survey, Em. Apr 7 1946, Ex *Semiothisa sexmaculata* (F.I.S., CNC); Franconia, N.H., VII-1-46, M. Townes (CHT); Mt. Madison, N.H., June 23 1938, H. & M. Townes (CHT); Mt. Madison, N.H., June 26 1938, H. & M. Townes (CHT); Pinkham Notch, N.H., June 25, 1938, H. & M. Townes (CHT); Ottawa, Ont., 18-VII-1946, A. Brooks (CNC); Spring



Br., Pa., VII-1-1945, H.K. Townes (CHT); Portage, P.E.I., 18-VII-1940, G.S. Walley (CNC); Green Lake, Sask., Em. 9-III-50, F.I.S:W-2408A, Ex Semiothisa sexmaculata (CNC); Gr.Sm.Mt.Nat. Park, Tenn., J.G. Chillcott, Indian Gap to Clingman's Dome 5200-6600', Tenn., 6-VIII-1957 (CNC); Lake Willoughby, Vt., Alt. 3200 ft., June 17-29, 1945, C.P. Alexander (CHT); Ashford, Wash., Aug. 18, 1940, H. & M. Townes (3♂ in addition to allotype, CHT).

Hosts: Geometridae: Caripeta divisata, Hydriomena sp., Nyctobia limitaria, Semiothisa sexmaculata.

### The Enargiae Group

Ocelli of normal size, eye fairly large but only moderately projecting from head outline in plan view, head oblong elliptic or buccate, temple rather bulging; gena widening from temple to near base of mandible and without conspicuous change of direction or angle (usually none), rather large area between stemmaticum and orbit almost impunctate; epomia usually weak and multiple, not reaching collar at upper end before midline, enclosure usually very narrow; punctation of mesocutum and mesopleurum fairly strong and dense, usually stronger and denser just above change of direction from pleurum to sternum; prescutum somewhat wider anteriorly than parapsides, little raised above them, but set off by rather broad indentations at anterior ends of notauli; scutellum moderately strongly convexly elevated, lateral carina obsolete in larger specimens, somewhat distinct in smaller ones; propodeum quite convex in all aspects, rather large in proportion to thorax, usually with few carinae or strong rugae, and rather finely weakly reticulate; petiole usually distinctly wider than deep, rarely slightly deeper than wide; postpetiole usually slightly convergent caudad, occasionally deeper than wide, often wider than deep, in the latter case often with one or more shallow rounded longitudinal grooves; hindleg somewhat incrassate. Only species included is enargiae.

#### 9. Aphanistes enargiae, new species

Female: Forewing 5.65--12.95 mm, body 9.2--18.75 mm; antenna 5.6--10.1 mm, 32--41 segments, first flagellar segment 3.68--4.6 times as long as wide, combined length of second and third segments 0.86--1.12 times first; head thickness-width ratio 1.62--1.77, head length-width ratio 1.14--1.23, head thickness-camber ratio 2.95--4.25, occipital camber 3.6--5.7, head-occiput width ratio 1.18--1.39, eye-temple ratio 1.23--2.5; mesoscutum index 1.05--1.23, head width 1.2--1.6 times mesoscutum width, scutellum 1:0.86--1.1:0.5--0.6; depth:width:length of propodeum 1:1.0--1.25:0.95--1.2; hindbasitarsus 7.045--10.0 times as long as thick (in one specimen compressed with ratio to the two thicknesses 6.88 and 8.44), first tergite 1.014--1.258 times as long as hindbasitarsus; width of postpetiole 0.6--0.88 times length, first tergite 3.4--4.2 times as long as postpetiole.

Habitus somewhat stout. Inner orbit relatively finely fairly closely punctate, sculpture of median field of face from similar to that of inner orbit with a few vertical wrinkles (chiefly smaller specimens) to wholly somewhat closely finely wrinkled; frons rugulosopunctate to rugulosoreticulate; gena moderately closely finely punctate, basically widening from temple toward base of mandible (but widest a little above lower end of eye, though not dis-



tinctly narrowing below this point) and without conspicuous change of direction or angle near midpoint of genal carina (usually none); rather large area between apex of eye and stemmaticum almost impunctate, stemmaticum and vertex strongly punctate. Pronotum rugulose around edges, rather closely moderately finely punctate otherwise, with polished impunctate spot near center of lateral portion, especially in small specimens, or rather distinctly rugulose throughout; epomia usually weak and multiple (most often triple), not reaching carina of collar at upper end before midline, enclosure usually very narrow, straight-line length from outer end to midline 5--10 times maximum interior width, sometimes indistinctly closed; mesoscutum fairly closely strongly punctate, notauli rather distinctly defined, moderately sharply impressed, but consisting of a line of very closely spaced punctures rather than a groove and rather shallow; prescutum not much raised above parapsides, but set off by depressions at anterior ends of notauli, prescutum rather wide anteriorly with notauli fairly strongly divergent; mesopleurum rather densely slightly coarsely punctate, usually more strongly and densely just above change of direction from pleurum to sternum and more or less rugulose under forewing; scutellum moderately strongly convexly elevated, distinctly rising from anterior carina for about one-third its length, sometimes with a slight conicity or an obscure transverse ridge, sometimes more or less quadrangular, especially in small specimens, in which also lateral carina (usually indistinct or obsolete) may be somewhat distinct, rather densely distinctly punctate. Propodeum quite convex in all aspects, rather large in proportion to thorax, from rather closely finely weakly rugulosoreticulate with only area dentipara fairly distinct (rather short and wide) and a trace of pleural carina to more openly and less finely rugulosoreticulate with a portion of the lateral longitudinal carina behind the area dentipara also more or less distinct; lower portion of pleural area and upper portion of metapleurum rather strongly bulging, metakatepisternum more or less distinctly inflexed. Forecoxa subglobose, undersurface from flattish convex to slightly elevated with an indistinct conicity, which when present may form the inner end of an indistinct rounded ridge without distinct change of direction of the surface on either side. Hindleg somewhat incrassate. Petiole rarely slightly deeper than wide, most frequently distinctly to strongly wider than deep; postpetiole occasionally rather deep, usually wider than deep, in the latter case often with one or more shallow rounded longitudinal grooves, postpetiole usually slightly convergent caudad behind spiracles.

Antenna from fulvoferruginous to piceous, with part of upper surface of first flagellar segment, usually pedicel, and sometimes upper surface of scape black, lower surface or whole of scape yellow. Head yellow except tip of mandible black, margin of clypeus including mucro fulvous, temple fulvoferruginous or black, frons, stemmaticum, and vertex black except yellow orbital spot and sometimes ferruginous lateral margin; upper part of occiput black. Thorax may be from wholly fulvous except spot before scutellum, spot beneath forewing, mesosternum, side and apical margin of scutellum, to wholly black except for reddish tinge on disc of scutellum, small spot of reddish tinge on mesopleurum before speculum, and the portion of the pleural and metapleural region of propodeum immediately in front of hindcoxa. First tergite more or less infusate with postpetiole sometimes strongly so but not black; second tergite broadly black along midline, lateral margin dull fulvous as is remainder of abdomen, last two or three tergites with rather heavy infuscation. Legs yellow except inner surface of fore- and midtibiae and -femora, sometimes fore- and midcoxae, and hindfemur fulvoferruginous; hindfemur rather infus-



cate; apex of hindtibia and at least upper surface of hindcoxa and hindtrochanters black; base of hindbasitarsus sometimes orange-tinged. Wings subhyaline to occasionally slightly infusate.

Male: Forewing 5.8--10 (?--incomplete, estimated 10.3) mm, body 12.4--19.2 mm (specimen with forewing 5.8 mm lacks abdomen); antenna (more than 6.4)--9.6 mm (missing or incomplete in largest specimens), (more than 29) 35--37 (probably more: see foregoing) segments, first flagellar segment 3.8--5.2 times as long as wide, combined length of second and third segments 0.91--1.15 times first; head thickness-width ratio 1.63--1.785, head length-width ratio 1.17--1.28, head thickness-camber ratio 2.47--4.0, occipital camber 3.3--5.3, head-occiput width ratio 1.2--1.4, eye-temple ratio 1.6--2.76; mesoscutum index 1.06--1.24, head width 1.26--1.49 times mesoscutum width, scutellum 1:0.9--1.1:0.45--0.65; depth:width: length of propodeum 1:1.05--1.25:0.94--1.26; hindbasitarsus 5.6--8.3 times as long as thick, first tergite 1.0--1.36 times as long as hindbasitarsus; width of postpetiole 0.6--0.78 times length, first tergite 3.22--3.86 times as long as postpetiole.

Sculpture and color generally as in female, but with general wrinkling of face only in a minority of specimens, and in a number of specimens the mesopleurum rather rugulosoreticulate below the subalar rugulosity.

Material examined: 58♀♀, 40♂♂.

Type: ♀, Ex E. decolor, Cedar Lake Field Station, Ont., Em. Mar. 8/60, Inc. (CNC); allotype: ♂, Ex Enargia decolor, Cedar Lake Field Station, Ont., Em. Feb. 22/60 (CNC); paratypes: ♀♀, Ex Nyctobia limitaria, 59A 809-01, Em. 15-II-60, Inc., F. I. S., Hinton [Alta.] (CNC); McMurray, Alta., 22 VI 53, G. E. Ball (CNC); No. 48-2652A, Date 4-III-48, F. I. S. 1949, Melanolophia imitata, Alice Arm, B. C. (CNC); No. B051-1786, Date 5-III, F. I. S. 1952, Melanolophia imitata Mi31, Big Bend, B. C. (CNC); No. 50-694, Date 19-II, F. I. S. 1951, Geometrid, Cambie, B. C. (CNC); Clinton, B. C., 18-VI 1938, J. K. Jacob (CNC); No. P49-548G, Date 11-IV-50, F. I. S. 1949, Geometrid, Comox, B. C. (CNC); No. P49-490C, Date 18-III-50, F. I. S. 1949, Geometridae, Denman Island, B. C. (CNC); No. BC49-1376, Date 23-III-50, F. I. S. 50, N. limitaria, Fernie, B. C. (CNC); No. B. C. 49-2017F, Date 5-IV-50, F. I. S. 1950, Itame hulstaria, Golden, B. C. (CNC); No. 50-633A, Date 31-I-, F. I. S. 1951, M. imitata, Grand Beach, B. C. (CNC); No. BC48-2170, Date 19-II-, F. I. S. 1949, Enypia moilleti?, Grenville Channel, B. C. (CNC); 56-846-01A, R'd, Kakweiken R, BC, Ex Aseptis binotata (CNC); No. P49-1860A, Date 13-IV-50, F. I. S. 1949, Geometrid, Kildonan, B. C. (CNC); No. BC48-2314, Date 24-II-, F. I. S. 1949, Enypia moilleti?, Lowe Inlet, B. C. (CNC); No. 51-1685A, Date 4-II-, F. I. S. 1952, N. limitaria, Miocene, B. C. (CNC); No. 50-211C, Date 2-II-, F. I. S. 1951, N. limitaria, Pritchard, B. C. (♀♀, one CNC, one HPH); No. B. C. 48-1005, Date 3-2-49, F. I. S. 1949, Phalaenid, Quesnel, B. C. (CNC); No. P49-739D, Date 23-III-50, F. I. S. 1949, Geometrid, Sproat River, B. C. (CNC); No. BC51-2320A, Date 29-II, F. I. S. 1952, Trout Lake, B. C. (CNC); No. P49-1854A, Date 13-IV-50, F. I. S. 1949, Geometrid, Ucluelet, B. C. (CNC); No. P49-1285C, Date 22-III-50, F. I. S. 1949, Geometrid, Wellington, B. C. (CNC); No. BC49-866E, Date 27-III-50, F. I. S. 1950, N. limitaria, White-mans Cr., B. C. (CNC); No. 50-886A, Date 5-II-, F. I. S. 1951, N. limitaria, Wynndel, B. C. (CNC); nr Estes Pk, Colo, June 15, 1948, HMGD&J Townes (CHT); Aweme, Man., R. M. White, 13.VI.1922, 38 (CNC); 5 mi. SW Shilo, Man., 5-VI-1958, C. D. F. Miller (2♀, CNC); Sprague, Man., Em. 18-II-52, F. I. S.: W-1709A, Ex Orthosia hibisci (CNC); ex P. porcelaria,



Spruce Woods, Man., Rec; 6301, F. I. Survey 1939, Em. (Incubator), 16-V 1939 (CNC); ex P. porcelaria, Spruce Woods, Man., Rec; 8301, F. I. Survey 1939, Em. (Incubator), 17-V 1939 (CNC); ex P. porcelaria, Treesbank, Man., Rec; 6298A, F. I. Survey 1939, Em. (Incubator), 19-V 1939 (CNC); Cadillac Mt. Me, VI-14-35, C. P. Alex [sic!] (USNM); MICHIGAN, Cheboygan Co., VI-27-28-1949, G. W. Byers (UMI); Loc. Madawaska Co., N. B., Host: Nyctobia limitaria, Rec. (B), F. I. Survey 1949, Em. Feb. 22, 1950 (F. I. S., CNC); Loc. St. Georges, NFLD., Host. Nyctobia limitaria, Rec. (Z) ♀, F. I. Survey 1950, Em. Mar 19 1951 (F. I. S., CNC); Loc. mi. 56 Cabot T., Inv. Co., N. S., Ex. undet. Host. 52-L618, Rec. 52-L618, F. I. Survey, Em. Mar. 20 1953 (F. I. S., CNC); Ex Geometridae, Barry's Bay, Ont. 82, No. Sso 3459-03, Date 13-IX-50, F. I. S. 1950 (CNC); Ex Enargia decolor, Cedar Lake Field Station, Ont., Em. Feb. 15/60, Inc. (CNC); Ex Enargia decolor, Cedar Lake Field Station, Ont., Em. Feb. 22/60, Inc. (3♀, two CNC, one HPH); Ex Enargia decolor, Cedar Lake Field Station, Ont., Em. Feb. 23/60, Inc. (3♀, CNC); Ex Enargia decolor, Cedar Lake Field Station, Ont., Em. Feb. 26/60, Inc. (2♀, CNC); Ex Geometrid sp., Cloyne, Ont., No. 050-1303C, Date 2-IV-51, F. I. S. 1950 (CNC); ex Ectropis crepuscularia, Halls Lake, Ont., No. 052-1607B, Date 3-III-53, F. I. S. 1952 (CNC); Ex Geometridae, North Bay, Ont. 71, No. S49-2323F, Date 8-IX-1949, F. I. S. 1949 (CNC); Ex Phalaenidae, Thessalon, Ont., No. S47--785E, Date 1-III-1948, F. I. S. 1947 (F. I. S., CNC); Ex Ectropis crepuscularia, Tory Hill, Ont., No. 050-1256C, Date 14-III-51, F. I. S. 1950 (CNC); Ex Phalaenidae, Twp. Prince, Sec. 32, [Ont.,] No. S46-903, Date 24-III-1947, F. I. S. 1946 (F. I. S., CNC); Linglestown, Pa., V-30, Champlain (USNM); Ex S. granitata, Lac Pentecote [P. Q.], R. I. F. '40, 4677 Em. 20-II-41 (CNC); Pierceland, Sask., Em. 13-II-52, F. I. S: W-1488, Ex Iphimorpha pleonectusa (F. I. S., CNC); paratypes: ♂♂, Waterton Lakes, Alta., 30-VI-1923, J. McDunnough (CNC); No. 60-1004, Date 29-I-, F. I. S. 1951, N. limitaria, Aleza Lake, B. C. (CNC); No. 50-1736E, Date 5-III-, F. I. S. 1951, M. imitata, Anstey Arm, B. C. (CNC); No. BC49-1260C. Date 20-III-50, F. I. S. 1950, N. limitaria, Ft. Fraser (CNC); No. P50-1804, Date 14-III-51, F. I. S. 1950, M. imitata, Grouse Mt., B. C. (CNC); No. 50-656A, Date 31-I-, F. I. S. 1951, N. limitaria, Inonoaklin, B. C. (CNC); No. P49-550A, Date 1-IV-50, F. I. S. 1949, Nyctobia Sp., Merville, B. C. (CNC); No. 50-1018, Date 28-I-, F. I. S. 1951, N. limitaria, Monashee, B. C. (CNC); No. P49-1737A. Date 31-III-50, F. I. S. 1949, Geometrid, Nuchalat Arm, B. C. (CNC); No. P49-2894A, Date 19-IV-50, F. I. S. 1949, Geometridae, Prince Rupert, B. C. (CNC); No. P49-1318, Date 20-III-50, F. I. S. 1949, Geometrid, Royston, B. C. (CNC); No. 50-692A, Date 29-I-, F. I. S. 1951, N. limitaria, Solsqua, B. C. (CNC); No. P49-1788, Date 4-IV-50, F. I. S. 1949, Geometrid, Tofino Inlet, B. C. (2♂, one CNC, one HPH); No. P49-1858A, Date 6-IV-50, F. I. S. 1949, Lepidoptera, Ucluelet, B. C. (CNC); No. 50-1414A, Date 28-I-, F. I. S. 1951, N. limitaria, Wingdam, B. C. (CNC); No. BC51-1138C, Date 10-III, F. I. S. 1952, Phalaenidae, Wynndel, B. C. (CNC); No. 50-628A, Date 29-I-, F. I. S. 1951, N. limitaria, Yard Creek, B. C. (CNC); Antrim Co., Mich., VII-4-60, R., K. Dreisbach (Dreisbach); W. Fish Pt., Chippewa Co., Mich., 1 Aug. 14, F. Combs (Dreisbach); Mt. Washington, N. H., a-4000, VII-4, 1914 (USNM); Ex Geometridae, Angus, Ont., Rec: 4224B, F. I. Survey 1938, Em. 11-X 1938 (CNC); Ex Enargia decolor, Cedar Lake Field Station, Ont., Em. Feb 15/60, Inc. (2♂, CNC); Ex Enargia decolor, Cedar Lake Field Station, Ont., Em. Feb 22/60, Inc. (5♂, including allotype, CNC); Ex E. decolor, Cedar Lake Field Station, Ont., Em. Mar. 18/60, Inc. (CNC); Ex Phalaenid,



Hawk Lake, Ont., No. S45-984, Date 8-III-1946, F. I. S. 1945 (CNC); Ex Phalaenid sp., Kaladar, Ont., No. 049-494A, Date 7-II-50, F. I. S. 1949 (CNC); Ex Ectropis crepuscularia, Lassarade, Ont., No. 050-1285B, Date 16-IV-51, F. I. S. 1950 (CNC); Marmora, Ont., 29-V-1952, J. C. Mitchell (CNC); Ex Geometridae, North Bay 71, Ont., S51-3969-01-1, 4-IX-1951, F. I. S. 51 (F. I. S., CNC); ex E. hastata, Sand L., Ont., Rec.: 2358C, F. I. Survey 1940, Em. (Incubator), 27-II-1941 (CNC); S58-5013-01-1, Ex Enargia decolor, Vermilion Bay, #18 Ont., Em. 20-II-59, Inc., F. I. S. (CNC); Ex Geometridae, Crow Bridge, Que., R. I. F. '40, 8961B, Em. 18/8, F. I. S. Que '42 (CNC); Rec.: 1741 B, F. I. Survey 1940, Em. (Incubator), 19-III 1941, ex E. crepuscularia, St. Ambroise, Que. (CNC); Claslyn, Sask., Em. 22-2-54, F. I. S. W-X 1352 (02), Host Phalaenid sp. (CNC).

Hosts: Geometridae and Noctuidae ('Phalaenidae'): Aseptis binotata, Ectropis crepuscularia, Enargia decolor, Enypia moilleti? [moillieti], Eulype hastata, Iphimorpha pleonectusa, Itame hulstaria, Melanolophia imitata, Nyctobia limitaria, Orthosia hibisci, Protoarmia porcelaria.

### The Basilicon Group

In this group, the ocelli are of normal size for the genus and the eye of moderate size, distinctly extending beyond outline of head in plan view but not prominent; temple rather convex, head elliptical (weakly convergent behind) or buccate; gena from nearly parallel to orbit to somewhat convergent toward mandible, occipital carina weakly to indistinctly angled by cheek; sculpture of frons, stemmaticum, and vertex fine, moderately dense, the whole subpolished; mesoscutum, scutellum, and mesopleurum rather finely, shallowly, moderately densely punctate; notauli moderately sharp to obsolete, prescutum not or little wider than parapsides; space enclosed by epomia short or of moderate length (one-fifth to one-third the length from midline to outer edge of pronotum), of moderate width or narrow; sternaulus rather short, usually not sharply impressed; hindbasitarsus rather long and slender; propodeal fossa shallow: uniformly in one species, in the other two almost flat cephalad, more distinct caudad; petiolar area nearly flat, weakly concave, often with a very shallow narrow medial "gutter" bounded by weak straight parallel longitudinal rugulae; postpetiole without sculpture. Species included are masoni, walleyi, and basilicon.

#### 10. Aphanistes masoni, new species

Female: Forewing 8.2--12.5 mm, body 14.4--20.2 mm; antenna 11.2--12.25 mm (may not cover the true range of the material examined, since few specimens have complete antennae), 42--43 segments, first flagellar segment 4.8--6.0 times as long as wide, combined length of second and third segments 0.80--0.99 times first; head thickness-width ratio 1.625--1.797, head length-width ratio 1.09--1.17, head thickness-camber ratio 2.6--3.9, occipital camber 3.4--4.8, head-occiput width ratio 1.13--1.39, eye-temple ratio 1.43--2.05; mesoscutum index 1.18--1.275, head width 1.34--1.5 times mesoscutum width, scutellum 1:0.95--1.2:0.6--0.7; depth:width:length of propodeum 1:0.97--1.09:1.02--1.125; hindbasitarsus 11.04--12.8 times as long as thick, first tergite 1.02--1.18 times as long as hindbasitarsus; width of postpetiole 0.55--0.66 times length, first tergite 3.41--4.36 times as long



as postpetiole.

Habitus intermediate. Face rather finely and sparsely punctate, with punctures in lines, giving effect of being rugulosopunctate, without any rugulae being present except in a small number of specimens, in which longitudinal wrinkles found in several other species occur; frons finely closely punctate, forming rugulae toward and on stemmaticum; cheek rather finely weakly punctate, impunctate near orbits. Lower part of epomia abruptly turned toward collar, sometimes angled, enclosure short, less than 0.4 times length of cephalic margin of pronotum from outer end to midline, narrow; length from outer/lower end to midline of pronotum at least four times interior width; a more or less distinct polished impunctate spot on sides of pronotum; mesoscutum rather finely closely and deeply punctate; notauli distinct but not sharply impressed; scutellum usually rather distinctly elevated, either convex or with weak median longitudinal depression, appearing wider in proportion to its length than indicated by measurements above, usually rather steeply descending to the lateral carina; mesopleurum rather polished, with distinct small punctures separated by about their diameter; sternaulus usually rather broad and shallow, very rarely sharply impressed, less than two-fifths length of pleurum; prepectal carina present only at extreme lower end. Propodeum rather polished, rugae usually rather reduced; area dentipara clearly defined, nearly triangular, little longer than wide, rather distinctly less than one-half length of propodeum, usually with few, weak rugulae in interior and rather broad shallow punctures, usually rather polished; areola not clearly defined, posterior carina wholly lacking; propodeal fossa nearly wanting cephalad, rather shallow caudad, pleural carina strong, lateral longitudinal carina indistinct; petiolar area nearly flat, very weakly concave, sometimes with (weak) transverse ridges continuous across its surface and often with narrow very shallow longitudinal parallel-sided "gutter" from areola to insertion of petiole; metakatepisternum rather strongly inflexed.

Fulvoferruginous or sometimes ferruginous. Antenna ferruginous to fuscous with some black and yellow on scape and pedicel. Head with the usual distribution of yellow and black. Mesoscutum ferruginous, prescutum sometimes infusate, in one specimen extensively black; scutellum usually yellow or yellowish, occasionally fulvoferruginous; mesopleurum usually slightly yellow-tinged, sometimes with yellow spots toward anterior and posterior ends of line between pleurum and sternum; mesosternum usually more or less black, as are usually spot beneath wings and always patch before scutellum. Propodeum fulvoferruginous, with metapleurum more or less tinged with yellow and sometimes with metakatepisternum or parts of the upper surface black. Abdomen fulvous, more or less yellow-tinged. Wings hyaline to subhyaline. Legs with usual coloration: all tarsi, fore- and midlegs almost wholly, and base of hindtibia yellow; hindcoxa above and apex of hindtibia black.

Male: Forewing 7.3--10.6 mm, body 14.5--18.8 mm; antennae incomplete in all specimens, first flagellar segment 4.2--6.1 times as long as wide, combined length of second and third segments 0.96--1.0 times first; head thickness-width ratio 1.6--1.7, head length-width ratio 1.17--1.2, head thickness-camber ratio 2.95--3.7, occipital camber 3.9--4.5, head-occiput width ratio 1.27--1.39, eye-temple ratio 1.36--2.075; mesoscutum index 1.2--1.35, head width 1.46--1.51 times mesoscutum width, scutellum 1:1.06--1.26:0.53--0.66; depth:width:length of propodeum 1:1.0--1.15:1.05--1.15; hindbasitarsus 9.0--10.53 times as long as thick, first tergite 1.0--1.19 times as long as hindbasitarsus; width of postpetiole 0.52--0.604 times length, first tergite



3.2--4.35 times as long as postpetiole.

Sculpture as in female, but often with slightly coarser punctation of mesopleurum and rugulosity of propodeum. Color as in female, but often with slightly more black; however two specimens have black restricted to stemmaticum and a very small spot before scutellum, hindtibia and second abdominal tergite. These two also have more extensive yellow on sternum and pleurum; in some other specimens yellowish coloration of metapleurum weak, but with a small yellow spot always present above base of hindcoxa, and in a few specimens there is a fair-sized yellow spot at about center of mesopleurum.

Material examined: 37♀♀, 15♂♂.

Type: ♀, Highlands, N. C., 3-VI-1957, W. R. M. Mason, Horse Cove, 3000' (CNC); allotype: ♂, Mt. Madison, N. H., June 23, 1938, H. & M. Townes (CHT); paratypes: ♀♀, Waterton, Alta., Jul. 3, 1924, H. L. Seamans (CNC); Hartford, Conn., 29-VI-1966, G. H. Heinrich (HPH); Flying, VI-15-18, Lyme, Conn., WmMiddleton, Collector (USNM); Tray Mt., Ga., 6-19-36, P. W. Fattig (USNM); Algonquin, Ill., Col. CF Baker (USNM); Dryden, Me., VII-1956, G. H. Heinrich (HPH); Magnolia, Mass. (Holland), Aug. 2, 1902, Holland Collection (Pittsburgh); Huron Mts., Mich., June 27, 1961, H. & M. Townes (2♀, CHT); Huron Mts., Mich., June 30, 1961, H. & M. Townes (CHT); Midland Co., Mich., VI-21-38, R. R. Dreisbach (CNC); Ontonogan Co., Mich., 6-18-60, R. & K. Dreisbach (Dreisbach); Ithaca, N. Y., 23 May '33 (USNM); Ithaca, N. Y., 5 June '33 (USNM); Ludlowville, N. Y. (Pittsburgh); Whiteface Mt., Adirondacks, N. Y., JM Aldrich Coll., VII-4, 3800 ft. (USNM); Highlands, N. C., 21-V-1957, W. R. M. Mason (CNC); Highlands, N. C., 26-V-1957, W. R. M. Mason (CNC); Highlands, N. C., 3800', 27-V-1957, J. R. Vockeroth (CNC); Highlands, N. C., 3800', 8-VI-1957, J. R. Vockeroth (CNC); Highlands, N. C., 1-VII-1957, J. R. Vockeroth (CNC); Highlands, N. C., 14-VII-1957, C. J. Durden (CNC); Barrys Bay, Ont., 5-VII 1950, T. N. Freeman (CNC); Ottawa, Ont., 12-VI-1946, G. S. Walley, Dow's Swamp (CNC); Coraopolis, Pa., July 13, 1907 (Pittsburgh); Fairmount Pk., Philadelphia, Pa., 9-VII-1937, H. P. Hopper (HPH); Gleasonton, Pa., VII-20-38, G. E. Wallace (Pittsburgh); Spring Br. [= Brook], Pa., VI-8-1945, H. K. Townes (CHT); Spring Br., Pa., VI-11-1945, H. K. Townes (2♀, CHT); Spring Br., Pa., VI-12-1945, H. K. Townes (CHT); Spring Br., Pa., VII-3-1945, H. K. Townes (CHT); Georgeville, Que., 23-VI-1936, G. S. Walley (CNC); Kazubazua, Que., 28-VI 1933, G. S. Walley (CNC); Cleveland, S. C., VI-19-1961, G. F. Townes (CHT); Wattacoo, S. C., Pickens Co., VI-28-59, G. F. Townes (CHT); paratypes: ♂♂, North Berwick, Southern Maine, USA, June 1964, G. H. Heinrich (HPH); Aweme, Man., N. Criddle, 16-VI-1921, Ex no. 826-3 (CNC); Ann Arbor, Mich., May 23, 1962, H. & M. Townes (CHT); Wayne Co., Mich., Detroit, VI-9-1936, A. W. Andrews (UMI); Durham, N. H., Weed & Fiske (USNM); Ithaca, N. Y., VI-23-1935, H. K. Townes (CHT); Medina, N. Y., 13 June 1952, LL Pechuman (CHT); Great Smoky Mt. N. P., N. C., 28-V-1957, W. R. M. Mason, Indian Gap, 5200' (CNC); Crisp, Pa., C. M. Acc. 321., July 190 [sic!] (Pittsburgh); Spring Br., Pa., VI-12-1945, H. K. Townes (CHT); Ingersoll, Ont., 25-VI-1939, G. S. Walley (CNC); Macdiarmid, Ont., L. Nipigon, VII-10-21, N. K. Bigelow (CNC); Beechgrove, P. Q., 7-VI-1955, R. Lambert (CNC); Stoneham, P. Q., June 21, 1938, H. & M. Townes (CHT).



11. Aphanistes walleyi, new species

Female: Forewing 6.95--10.1 mm, body 12.1--19.2 mm; antenna 7.6--10.5 mm (lacking in largest specimen), 36--39 segments, first flagellar segment 4.77--5.87 times as long as wide, combined length of second and third segments 0.918--0.98 times first; head thickness-width ratio 1.6--1.7, head length-width ratio 1.11--1.17, head thickness-camber ratio 3.45--4.1, occipital camber 4.38--5.2, head-occiput width ratio 1.24--1.33, eye-temple ratio 1.5--2.13; mesoscutum index 1.2--1.266, head width 1.35--1.53 times mesoscutum width, scutellum 1:1.06--1.25:0.46--0.69; depth:width:length of propodeum 1:1.03--1.125:1.11--1.2; hindbasitarsus 8.33--12.44 times as long as thick, first tergite 1.23--1.42 times as long as hindbasitarsus; width of postpetiole 0.56--0.69 times length, first tergite 3.659--4.0625 times as long as postpetiole.

Habitus somewhat slender. Clypeus and face moderately convex, head profile very broadly elliptical; face moderately finely distinctly punctate with some longitudinal wrinkles and with rather short, dense, conspicuous perpendicular pubescence (facial hairs of most other species are sparser, longer, and inclined forward); frons and vertex punctate and rugulosoreticulate; cheek moderately finely distinctly punctate, temple more deeply and coarsely. Mesoscutum and mesopleurum rather finely fairly closely punctate (punctures separated by one-half to one times their diameter); notauli rather indistinct, especially posteriorly, represented by quite shallow longitudinal depressions with slightly closer punctures than adjacent areas, becoming shallower and with less contrast in punctation caudad, sometimes obsolete with slight change of elevation between prescutum and parapsides anteriorly; scutellum with rather distinct anterior declivity, slightly elevated, lateral carina evident but somewhat indistinct, sometimes a shallow longitudinal depression present, usually extending across disc; lower end of epomia abruptly turned toward collar, remainder nearly parallel to collar, enclosure very short, about one-fifth length of cephalic margin of pronotum, and less than one-half as wide as long; sternaulus broad, shallow, not sharply impressed, not more than two-fifths length of pleurum. Propodeum usually rather coarsely reticulate, area dentipara (not separated from first lateral area) and areola (open behind) defined, former irregularly trapezoidal, truncate caudad, about one and one-half times as long as wide and about one-half length of propodeum, rugose; propodeal fossa broad and shallow but distinct, more or less uniform throughout length of propodeum, pleural carina usually indistinct or obsolete, lateral longitudinal carina indistinct behind area dentipara; petiolar area nearly flat, very weakly concave, often with narrow very shallow longitudinal parallel-sided "gutter" from areola to insertion of petiole. Hindfemur rather incrassate, hindtarsus slender. Petiole often rather elevated before spiracles.

Color fulvoferruginous. Antenna brown with black on first flagellar segment above, scape and pedicel more or less yellow; face, clypeus, mandible except tip, cheek, and orbital spot yellow; temple fulvoferruginous, sometimes black above; tip of mandible, frons, vertex, and upper part of occiput black. Thorax fulvoferruginous, with patch before scutellum, side of scutellum, spot on mesopleurum adjacent to base of hindwing, mesosternum, side of metanotum, metanepimerum, metakatepisternum, metasternum, and often extreme base of propodeum black; area along boundary between pronotum and mesoscutum usually yellow-tinged, disc of scutellum yellow-tinged or yellow, propodeal fossa yellow-tinged to yellow. Legs yellow with fore- and midfemora tinged



with ferruginous, hindfemur fulvoferruginous, hindcoxa more or less black as are hindtrochanters, apical portion of hindtibia black. Abdomen fulvoferruginous, sometimes with some black at apex. Wings subhyaline to moderately infusate or rarely hyaline.

Male: Forewing 7.3--9.9 mm, body 14.6--20.5 mm; antenna 7.6--(more than) 11.5 mm (smallest and largest specimens have antennae incomplete), 37--39 segments, first flagellar segment 4.4--5.5 times as long as wide, combined length of second and third segments 1.024--1.088 times first; head thickness-width ratio 1.57--1.72, head length-width ratio 1.08--1.17, head thickness-camber ratio 3.9--4.3, occipital camber 5.16--5.5, head-occiput width ratio 1.25--1.35, eye-temple ratio 1.4--2.1; mesoscutum index 1.15--1.31, head width 1.295--1.475 times mesoscutum width, scutellum 1:0.93--1.27:0.45--0.666; depth:width:length of propodeum 1:1.01--1.18:1.03--1.33; hindbasitarsus 5.48--7.94 times as long as thick, first tergite 1.297--1.55 times as long as hindbasitarsus; width of postpetiole 0.56--0.75 times length, first tergite 3.76--4.25 times as long as postpetiole.

Sculpture as in female. Color differing only in that a number of specimens have no yellow on thorax and propodeum except disc of scutellum (in one specimen this is fulvoferruginous) and on the other hand several specimens have rather extensive yellow-tinged blotches and/or yellow spots on thorax.

Material examined: 24♀♀, 16♂♂.

Type: ♀ and allotype, ♂ (on same pin): Kazubazua, Que., 21-VII-1927, G. S. Walley (CNC); paratypes: ♀♀, FIS W Ex 2127(07), S. F. R. [= Sandilands Forest Reserve], Man., Em. 9-4-57, Host *Anavitrinella pampinaria* (CNC); Ann Arbor, Mich., May 28, 1962, H. & M. Townes (CHT); Ann Arbor, Mich., VI-11-61, Trap, H. & M. Townes (CHT); Grand Traverse Co., Mich. VII-9-60, R., K. Dreisbach (Dreisbach); Ontonogan Co., Mich., 6-18-60, R. & K. Dreisbach (Dreisbach); Yellow Dog Plains, Marquette Co., Mich., July 21, 1959, Henry Townes (CHT); Yellow Dog Plains, Marquette Co., Mich., July 28, 1959, Henry Townes (CHT); Yellow Dog Plains, Marquette Co., Mich., July 31, 1959, Henry Townes (3♀, two CHT, 1 HPH); Aug. 3, 1902, on foliage of *Veratrum*, Beulah, 8000 ft., New Mexico, Cockerell (USNM); Saranac Lake, N. Y., 4-VIII-'46, RTMitchell, Collector (RTM); Deerlock, Ont., 18-VII-1960, S. M. Clark (CNC); Ft. Frances, Ont., 2-VIII-1960, S. M. Clark (CNC); Galetta, Ont., 22-VII-1942, G. S. Walley (CNC); Ottawa, Ont., 17-VII-1946, G. S. Walley, Dow's Swamp (CHC); Torrance, Ont., 16 June 1959, L. L. Pechuman (CHT); Portage, P. E. I., 18-VII-1940, G. S. Walley (CNC); Aylmer [probably Que.], 11-8-26, R. P. (CNC); Kazubazua, Que., 26-VI-1933, G. S. Walley (CNC); Kazubazua, Que., 18-VII-1935, F. A. Urquhart (CNC); Knowlton, Que., 16-VI-1936, G. S. Walley (CNC); Laurel Lake, nr. Jacksonville, Vt., VII or VIII-1936, Harry D. Pratt (USNM); paratypes: ♂♂, Ninette, Manitoba, 15-VII-1958, R. L. Hurley, Ex *Betula glandulosa* (CNC); Crawford Co., Mich., VII-10-59, R. and K. Dreisbach (Dreisbach); Huron Mts., Mich., July 25, 1959, Henry Townes, In heath bog (CHT); Ionia Co., Mich., 7-14-57, R. & K. Dreisbach (Dreisbach); Midland Co., Mich., 7-18-22-59, R. R. Dreisbach (Dreisbach); Olmsted Co., Minn., CNAinslie, Collector (USNM); Osceola Co., Mich., 7-7-47, R. R. Dreisbach (Dreisbach); Wayne Co., Mich., Grosse Ile, July 24, 1961, Geo. Steyskal (CHT); Yellow Dog Plains, Marquette Co., Mich., July 31, 1959, Henry Townes (CHT); Yellow Dog Plains, Marquette Co., Mich., June 28, 1961, H. & M. Townes (CHT); St John N B, July 21, 1902, A G Leavitt (USNM); Saranac Lake, N. Y., 12-VI-'46, RTMitchell, Collector (2♂, RTM); S. Milford, N. S., 25-VI-1934, J. McDunnough (CNC); Ft. Frances, Ont., 2-VIII-1960, S. M. Clark (CNC).



Hosts: Anavitrinella pampinaria (Geometridae).

## 12. Aphanistes basilicon (Davis)

Anomalon basilicon Davis, 1898 (1897). Amer. Ent. Soc., Trans. 24: 359.

Type: ♀, Moscow, Id. (Aldrich). Type in Academy of Natural Sciences of Philadelphia, Philadelphia, Pa.

Female: Forewing 7.45--11.7 mm, body 12.0--19.4 mm; antenna (less than) 9--(more than) 12.5 (smallest and largest specimens without or with incomplete antennae), 36--44 segments, first flagellar segment 4.59--5.625 times as long as wide, combined length of second and third segments 0.873--1.047 times first; head thickness-width ratio 1.58--1.73, head length-width ratio 1.106--1.163, head thickness-camber ratio 3.0--3.55, occipital camber 3.55--4.4, head-occiput width ratio 1.3--1.45, eye-temple ratio 1.7--2.4; mesoscutum index 1.166--1.275, head width 1.38--1.54 times mesoscutum width, scutellum 1:1.0--1.2:0.53--0.73; depth:width:length of propodeum 1:0.94--1.1:1.1--1.23; hindbasitarsus 10.5--15.0 times as long as thick, first tergite 1.0--1.24 times as long as hindbasitarsus; width of postpetiole 0.59--0.73 times length, first tergite 3.8--4.3 times as long as postpetiole.

Habitus moderately slender. Head in plan view more or less elliptical and when tilted to bring anterior edge of median ocellus to forward edge of head, line across frons from forward edge of one eye to other appears nearly straight. Punctures on clypeus rather few as usual (about 50 aside from those at margins), but not more than twice diameter of punctures on face (in other species three or more times), and those of this size few and near clypeal tooth, others little larger than those on face; face moderately finely and closely punctate, density decreasing only slightly toward orbits, those toward middle tending to run together into longitudinal wrinkles; occipital carina by gena nearly parallel to orbit except at temple or moderately convergent toward mandible, cheek with moderately sparse punctures (but somewhat denser than in most species of the genus), increasing in density and depth onto temple; frons and vertex mostly punctate-reticulate, becoming rugose-reticulate immediately in front of lateral ocelli, occasionally more extensively rugulose. Mesosternum polished, largely impunctate; mesopleurum moderately densely punctate, from subpolished to moderately polished, punctures fairly deep, separated by less than their diameter; prepectus usually similar in sculpture to pleurum, rarely with partial carina above sternum; epomia not parallel to collar, lower part forming a smooth curve, enclosure fairly large, extending one-fourth to one-third distance from midline to lateral margin of pronotum, width one-third to one-half length; mesoscutum subopaque, somewhat more finely and weakly punctate than pleurum, rugulose in front of scutellum; notauli rather sharply impressed; disc of scutellum usually rather flat, scarcely raised above lateral carina, with a small anterior declivity, rarely slightly to moderately elevated, sometimes with shallow longitudinal depression, subopaque, slightly more deeply densely punctate than mesoscutum. Propodeum strongly rugose-reticulate, not distinctly punctate; pleural carina strong, lateral longitudinal carina distinct, and those portions of median longitudinal carina bounding area dentipara (usually not separated from first lateral area) distinguishable; area dentipara about one-half length of propodeum, one and one-half to two times as long as wide, truncate caudad, reticulated, opaque; propodeal fossa shallow, barely or not depressed anteriorly, moderately shallow posteriorly; petiolar



area nearly flat, very weakly concave, often with very shallow narrow parallel-sided longitudinal "gutter" medially from areola to insertion of petiole. Petiole not elevated before spiracles.

Antenna fulvoferruginous to dark fuscous, usually fuscous; head yellow, with tip of mandible and usually frons, stemmaticum, and vertex (except orbital spot) and upper part of occiput black; clypeal tooth ferruginous to piceous, temple usually ferruginous, rarely black (in one specimen, only tip of mandible, small areas between lateral and median ocelli, and transverse stripe on occiput black). Thorax in one specimen wholly fulvoferruginous, otherwise usually with patch before scutellum and at least spot on side of scutellum, sometimes also spot beneath forewing and more or less of base of propodeum black; sterna and metakatepisternum at least with black markings; disc of scutellum and collar usually yellowish. Fore- and midlegs yellow except coxae and at least outer surface of femora and sometimes one side of tibiae fulvous; hindleg with upper surface of coxa and trochanters black or piceous, femur fulvoferruginous, base of tibia, and tarsus wholly, yellow; apex of tibia black. Wings usually subhyaline, often hyaline, rarely slightly infusate. Abdomen with mesal band on second tergite black, remainder fulvous or sometimes fulvoferruginous, sometimes with black blotches (that may be artifacts). Occasionally metakatepisternum black or marked with black, metanepimerum often black and rarely a black mark on sides of pronotum and on midline of cephalic margin of mesoscutum; in one case black mark in petiolar area. Sometimes metakatepisternum extensively yellow and sometimes yellow spot on metakatepimerum at base of hindcoxa and on propodeal pedicel.

Male: Forewing 7.5--10.25 mm, body 14.0--19.5 mm; antenna (lacking in one, incomplete in remainder: more than 9 mm), (more than 28 segments), first flagellar segment 4.3--5.5 times as long as wide, combined length of second and third segments 0.95--1.125 times first; head thickness-width ratio 1.59--1.74, head length-width ratio 1.11--1.19, head thickness-camber ratio 3.13--3.86, occipital camber 3.9--4.4, head-occiput width ratio 1.35--1.47, eye-temple ratio 1.77--2.33; mesoscutum index 1.175--1.25, head width 1.4--1.55 times mesoscutum width, scutellum 1:1.0--1.06:0.46--0.6; depth:width:length of propodeum 1:1.025--1.15:1.05--1.175; hindbasitarsus 9.26--10.4 times as long as thick, first tergite 1.065--1.277 times as long as hindbasitarsus; width of postpetiole 0.52--0.83 times length, first tergite 3.6--4.45 times as long as postpetiole.

Sculpture and color generally as in female. Head usually thicker and eyes distinctly larger (some tendency in this direction throughout family). In most (of only six) specimens, rather marked indentation between clypeus and face. In one specimen, scutellum rather strongly elevated. Thorax in three specimens with less black than usual in female, but one specimen has more (including propodeum); in all, metakatepisternum either wholly black or with black spot or at least lower margin black. Three specimens have yellow marks behind prepectus and at base of mid- and hindcoxae; only two have hindcoxa black above, three fuscous, and one ferruginous; all six have hindcoxa yellow below (ferruginous in female).

Material examined: 63♀♀, 6♂♂.

Distribution: Maryland, Michigan, Newfoundland, New Hampshire, New York, North Carolina, Ontario, Pennsylvania, Quebec, Saskatchewan, South Carolina, Vermont, Virginia, West Virginia.

(No host records.)



## The Fuscipes Group

In this group the ocelli are of normal size for the genus and the eye of moderate size, distinctly extending beyond the outline of the head in plan view but not prominent; temple rather convex, head elliptical to buccate, weakly convergent behind; gena indistinctly to distinctly convergent toward mandible, genal portion of occipital carina with slight distinct or indistinct change of direction but not angled. Top of head rather smoothly moderately convex, rather polished; face from rather flat to slightly to moderately prominent. Notauli usually sharp, occasionally indistinct to obsolete; scutellum flat to slightly elevated, distinctly longer than anterior width, disc flattish, usually with distinct shallow longitudinal depression, lateral carina distinct; mesopleurum with rather fine, sharp, moderately dense to rather sparse punctures; epomia enclosing small space, one-fourth or less length of pronotum, one-half or less as wide as long, triangular with ramus or smoothly curved. Propodeum rather polished, only weakly convex laterally; propodeal fossa sometimes moderately impressed, usually shallow, sometimes obsolete, especially cephalad; petiolar area essentially flat. Hindfemur slightly to distinctly incrassate. Species included are dreisbachi, heinrichi, and fuscipes.

13. Aphanistes dreisbachi, new species

**Female:** Forewing 7.74--11.13 mm, body 12.5--18.7 mm; antenna (less than) 9.3--(more than) 11.4 mm (smallest and largest specimens have incomplete antennae), 36--43 segments (see foregoing), first flagellar segment 4.76--5.75 times as long as wide, combined length of second and third segments 1.0--1.1 times first; head thickness-width ratio 1.658--1.75, head length-width ratio 1.1125--1.198, head thickness-camber ratio 3.2--5.0, occipital camber 4.2--6.3, head-occiput width ratio 1.27--1.37, eye-temple ratio 1.7--2.3; mesoscutum index 1.18--1.27, head width 1.43--1.54 times mesoscutum width, scutellum 1:1.1--1.42:0.53--0.83; depth:width:length of propodeum 1:0.98--1.11:1.15--1.2; hindbasitarsus 10.8--14.0 times as long as thick, first tergite 1.057--1.235 times as long as hindbasitarsus; width of postpetiole 0.57--0.63 times length, first tergite 3.5--4.1 times as long as postpetiole.

Habitus moderately slender. Face slightly prominent, forming nearly smooth line with clypeus in profile, with very shallow indistinct punctures separated by more than their diameter and with a weak ridge from each end of subantennal carina to upper edge of clypeus and a few longitudinal wrinkles in the middle; frons, stemmaticum, and vertex rather flat or (chiefly small specimens) very slightly convex, stemmaticum forming smooth line with rest, not or very slightly raised above frons (in latter case only within ocelli); frons, stemmaticum, and vertex distinctly rather closely rugulosopunctate, spaces between punctures less than one-half diameter of punctures, rather polished; ocellocular space and temple (especially former) more weakly and sparsely punctate, temple abruptly less punctate and more polished than vertex; ocellocular line slightly longer than diameter of lateral ocellus, latter separated from occipital carina by less than one-half its diameter. Mesoscutum and mesopleurum rather densely shallowly punctate, punctures separated by slightly less than their diameter, appearing rugulosopunctate at certain angles of illumination; pronotum rather extensively rugulose; epomia distinct, with more



or less of an angle at outer posterior point, often with ramus, enclosure about one third length of cephalic margin of pronotum, and with transverse (ladder-like) rugulae within; notauli rather sharply impressed, width of prescutum at widest point about equal to greatest width of one of parapsides, angle between notauli ca.  $150^\circ$ ; scutellum with punctation similar to mesoscutum, punctures in center of disc sometimes slightly larger than the rest, disc flat or with very slight longitudinal depression, scutellum very slightly elevated anteriorly, anterior carina obsolete, low, lateral carina distinct. Mesopleurum rather polished to subpolished (in smaller specimens), punctation similar to mesoscutum, area below wings with vertical rugulae anteriorly and horizontal rugulae posteriorly; speculum with slightly finer punctures, but no more polished than remainder except on the slight angle; prepectus rugulose; sternaulus shortish, about one-third length of pleurum, not sharply incised. Propodeum usually rather polished, sometimes subopaque, rather strongly rugose and rugulose, usually with stronger (but sometimes irregular) rugae corresponding to longitudinal carinae of areolation, usually anterior and lateral carinae of areola well-defined, areola and petiolar area forming a continuous rather flat surface; area dentipara fully bounded, usually not separated from first lateral area, outer carina usually especially strong, in particular at posterior angle, but not forming a tooth; propodeal fossa slightly to moderately impressed, often with very weak sculpture, pleural carina indistinct or obsolete; metapleurum only slightly convex, not bulging, metakatepisternum inflexed toward sternum. Hindfemur usually somewhat incrassate. Petiole narrow throughout, widening rather abruptly but only moderately to postpetiole, which is little or not at all wider than deep.

Fulvoferruginous. Antenna fulvous. Temple and most of thorax ferruginous (rather red), propodeum more or less and abdomen entirely fulvoferruginous. Face, mandible except tip, orbital spot, fore- and midlegs extensively, tegula, hindtarsus, and base of hindtibia yellow; tip of mandible, uppermost part of temple, vertex except orbital spot, stemmaticum, and upper part of occiput black; also black are: prepectus, spot under wings, mesosternum, patch before and side of scutellum, upper surface of hindcoxa, apical part of hindtibia, usually side of metanotum, metanepimerum, metakatepisternum, usually spots at base and apex of propodeum, usually most of prescutum, and sometimes mesoscutum, mesopleurum, and propodeum more extensively.

Male: Forewing 7.3--9.8 mm, body 12.8--17.0 mm; antenna 8.1--11.7 mm, 37--42 segments, first flagellar segment 4.0--5.4 times as long as wide, combined length of second and third segments 1.02--1.07 times first; head thickness-width ratio 1.59--1.7, head length-width ratio 1.13--1.2, head thickness-camber ratio 3.55--4.79, occipital camber 4.5--6.1, head-occiput width ratio 1.25--1.36, eye-temple ratio 1.8--2.5; mesoscutum index 0.9625--1.2375, head width 1.225--1.5 times mesoscutum width, scutellum 1:0.93--1.14:0.56--0.64; depth:width:length of propodeum 1:1.01--1.125:1.03--1.2; hindbasitarsus 5.0--8.57 times as long as thick, first tergite 1.326--1.65 times as long as hindbasitarsus; width of postpetiole 0.58--0.66 times length, first tergite 3.685--4.58 times as long as postpetiole.

Structure and sculpture generally as in female. Ocellocular line distinctly longer than diameter of lateral ocellus, latter about two-thirds its diameter from occipital carina; head in profile sometimes showing a slight indentation between face and clypeus. Color as in female, except one specimen (which also has scutellum rising from anterior margin to one-third length) with thorax and propodeum wholly black except ferruginous-edged yellow spot at center of mesopleurum and sutural margins of mesopleurum fulvous, side and apex of



propodeum yellow edged with fulvous, first tergite fuscous; clasper piceous to black in all specimens.

Material examined: 48♀♀, 37♂♂.

Type: ♀, Crabtree MdsNC, Yancey Co 3600', Aug 25 1950, HMD&J Townes (CHT); allotype: ♂, Yellow Dog Plains, Marquette Co., Mich., June 28 1961, H. & M. Townes (CHT); paratypes: ♀♀, Edmonton, Alta., 24 VII 1945, E. H. Strickland (CHT); Agassiz, B. C., 9-VI-1922, E. Glendenning (CNC); Kleanza Creek, nr. Terrace, B. C., 12-VII-1955, G. P. Holland (CNC); Chippewa Co., Mich., 6-25-60, R. and K. Dreisbach (Dreisbach); Gogebic Co., Mich., 6-29-55, R. R. Dreisbach (3♀, two Dreisbach, one HPH); Houghton Co., Mich., 6-20-60, R. and K. Dreisbach (2♀, Dreisbach); Huron Mts., Mich., July 22 1959, Henry Townes (CHT); Manistee Co., Mich., 7-5-57, R. & K. Dreisbach (Dreisbach); Ogemaw Co., Mich., 7-28-57, R. & K. Dreisbach (Dreisbach); Roscommon Co., Mich., 7-7-48, R. R. Dreisbach (UMI); Schoolcraft Co., Mich., 6-24-60, R. and K. Dreisbach (2♀, Dreisbach); Mt. Madison, N. H., June 23 1938, H. & M. Townes (2♀, CHT); Mt. Madison, N. H., June 26 1938, H. & M. Townes (2♀, CHT); Pinkham Notch, N. H., June 25, '38, H. & M. Townes (2♀, CHT); Randolph, N. H., July 2 1946, J. Peck & M. Townes (CHT); Ithaca, N. Y., 6 VII-47 (CNC); Saranac Lake, N. Y., 28-VI-'46, RTMitchell, Collector (RTM); Saranac Lake, N. Y., 30-VI-'46, RTMitchell, Collector (RTM); Saranac Lake, N. Y., 2-VII-'46, RTMitchell, Collector (RTM); NEW YORK, Ulster Co., Slide Mt., VII-11 1970, Fred Hough (USNM); Hamrick NC, Aug 17 '50, HM&DTownes (CHT); Wayah Bald, N. C., 4700', 29-VII-1957, W. R. Richards (CNC); Black Sturgeon Bay, L. Nipigon, Ont., VII-21-22, N. K. B. (CNC); Deerlock, Ont., 18-VII-1960, S. M. Clark (CNC); Macdiarmid, Ont., L. Nipigon, VII-10-21, N. K. Bigelow (CNC); Spring Brook, Pa., Aug 13, '44, H. K. Townes (2♀, CHT); Spring Br Pa, VI-27-1945, H K Townes (CHT); Spring Br Pa, VI-29-1945, H K Townes (CHT); Spring Br Pa, VI-30-1945, H K Townes (CHT); Spring Br., Pa., VII-3-1945, H. K. Townes (CHT); Spring Br Pa, VIII-27-1945, H K Townes (CHT); Alberton, P. E. I., 13-VII-1940, G. S. Walley (CNC); Georgeville, Que., 27-VI-1936, G. S. Walley (CNC); Knowlton, Que., 2-VII-1936, G. S. Walley (CNC); Nr. Cookshire, P. Q., VI-23-38, H. & M. Townes (2♀, CHT); Ste. Agathe des M., Que., 7-viii-1937, G. S. Walley (CNC); Stoneham, P. Q., June 18 1938, H. & M. Townes (CHT); Sutton, Que., 26-VII-1936, G. S. Walley (CNC); paratypes: ♂♂, Alger Co., Mich., VII-4-46, R. R. Dreisbach (Dreisbach); Gladwin Co., Mich., 6-15-52, R. R. Dreisbach (Dreisbach); Gogebic Co., Mich., 6-15-60, R. and K. Dreisbach (10♂, nine Dreisbach, one HPH); Houghton, Co., Mich., 6-20-60, R. and K. Dreisbach (3♂, Dreisbach); Midland Co., Mich., VI/12-21/61, R. R. Dreisbach (Dreisbach); Ontonogan Co., Mich., 6-18-60, R. and K. Dreisbach (Dreisbach); Schoolcraft Co., Mich., 6-24-60, R. and K. Dreisbach (Dreisbach); Nerepis, NB, 11 Jul, AG Levitt, Collector (USNM); Mt. Madison, N. H., June 24 1938, H. & M. Townes (CHT); Mt. Madison, N. H., June 26 1938, H. & M. Townes (CHT); Montvale, N. J., 27-VI-70, RTMitchell, Collector (RTM); Connecticut Hill, Tompkins Co., N. Y., 2000', 6-21-47 (CNC); Ithaca, N. Y., 11 VI 1947, W. Mason (CNC); Saranac Lake, N. Y. 17-VI-'46, RTMitchell, Collector (RTM); Saranac Lake, N. Y., 20-VI-'46, RTMitchell, Collector (RTM); Saranac Lake, N. Y., 23-VI-'46, RTMitchell, Collector (RTM); Saranac Lake, N. Y., 26-VI-'46, RTMitchell, Collector (RTM); Saranac Lake, N. Y., 6-VII-'46, RTMitchell, Collector (RTM); Saranac Lake, N. Y., 2-VIII-'46, RTMitchell, Collector (RTM); NEW YORK, Ulster Co., Overlook Mt., 7-16 1969, Fred Hough (USNM); Ex Geometridae, Gordon Lake, 36, Ont., No.



S50-0092-03, Date: 2-VI-1950, F. I. S. 1950 (CNC); Spring Br., Pa., VII-4-1945, H. K. Townes (CHT); Pa 2067, Collector, CFBaker (USNM); Stoneham, P. Q., June 18 1938, H. & M. Townes (2♂, CHT).

Hosts: Geometridae (only one record in the material).

#### 14. Aphanistes heinrichi, new species

Female: Forewing 6.04--8.3 mm, body 10.2--14.6 mm; antenna 6.14--8.5 mm, 32--35 segments, first flagellar segment 4.48--5.9 times as long as wide, combined length of second and third segments 0.86--1.03 times first; head thickness-width ratio 1.63--1.67, head length-width ratio 1.11-1.15, head thickness-camber ratio 3.6--4.95, occipital camber 4.3--6.4, head-occiput width ratio 1.215--1.36, eye-temple ratio 1.3--1.8; mesoscutum index 0.98 (? badly bent, perhaps should be 1.1)--1.2, head width 1.37--1.57 times mesoscutum width, scutellum 1:1.0--1.1:0.6--0.9; depth:width:length of propodeum 1:1.1--1.28:1.16--1.35; hindbasitarsus 8.5--9.7 times as long as thick, first tergite 1.23--1.43 times as long as hindbasitarsus; width of postpetiole 0.57--0.606 times length, first tergite 3.5--3.96 times as long as postpetiole.

Habitus moderately slender. Antenna slightly compressed, width about 0.8 depth. Face from rather flat to slightly prominent, median field not closely punctate, punctures separated by one to one and one-half times their diameter, inner orbit more sparsely punctate; cheek and temple sparsely shallowly punctate; frons moderately deeply punctate, punctures separated by about one-half to one times their diameter, usually becoming weakly to strongly rugulose along forward edge of stemmaticum; cheek, temple, frons, stemmaticum, and vertex rather highly polished. Thorax usually rather highly polished; pronotum rugulose along anterior margin only or sometimes all over; epomia occasionally difficult to discern (although carina not obsolete), usually with posteroinferior angle, sometimes with ramus; enclosure rather small, especially in small specimens; prepectus indistinct with only an inferior carina; sternaulus indistinct; mesoscutum and mesopleurum distinctly but not deeply (neither densely nor sparsely) punctate, punctures sharp and separated by one to one and one-half times their diameter, pleurum usually more or less rugulose under wings--usually only a small area, but sometimes more extensive; notauli indistinct, shallow, marked by an irregular line of punctures, sometimes almost wholly wanting (in which case anterior end marked by elevation of prescutum above parapsides), or sometimes sharp but consisting only of a line of punctures so close as to form furrows; scutellum slightly elevated with distinct anterior declivity with its summit at about one-third length of scutellum, sometimes disc has broad shallow longitudinal depression, lateral carina usually very strong, punctures on disc rather coarser and deeper than on mesoscutum, quite dense, often lying in longitudinal furrows separated by rugulae. Propodeum rather highly polished, almost impunctate, rather strongly rugose, first lateral area smooth, not separated from area dentipara by carina, second lateral area with a few rugulae; propodeal fossa distinct but shallow and rather narrow; petiolar area not distinctly separated from areola and third lateral area, broadly and very shallowly longitudinally depressed (nearly flat) usually with an indistinct narrow longitudinal furrow in middle. Hindfemur rather stout, hindtarsus usually distinctly compressed, especially in small specimens (two or three of the largest specimens examined had hindtarsi not perceptibly compressed). Postpetiole noticeably extended before



spiracles, petiole usually slightly widened and elevated in posterior two-fifths or more, no marked change of direction of outline between petiole and post-petiole in plan view. Ovipositor rather deep in proportion to its length and almost always with abrupt declivity in upper valve at distal end of nodus, the tip relatively long.

Flagellum of antenna fulvoferruginous (dark brown in one specimen), first segment tinged with piceous or black above, pedicel yellow and black, scape yellow. Head yellow except tip of mandible, frons except orbital spot, stemmaticum, vertex, and occiput above foramen black. Prescutum more or less black or piceous, mesoscutum otherwise ferruginous or in a few cases wholly black except extreme margins of parapsides; scutellum from wholly black to only side of scutellum and extreme apex of disc (apical flange) black, remainder ferruginous; mesopleurum black with fulvoferruginous area next to prepectus and another by base of midcoxa. Dorsum of propodeum and metakatepisternum black, remainder of metapleurum and pleural area fulvoferruginous. Fore- and midlegs yellow with femora fulvous; hindcoxa dorsally black or ferruginous, ventrally fulvous, hindfemur fulvoferruginous, hindtibia yellow at base, extensively black at apex, hindtarsus yellow. Wings usually subhyaline, sometimes hyaline or lightly infusate. First tergite ferruginous (sometimes infusate), second tergite medially black as usual for genus, laterally ferruginous (in one specimen entirely black); apex of abdomen more or less black. One specimen has thorax and propodeum wholly black except along sutures and spot behind base of hindcoxa.

Male: Forewing 5.9--8.2 mm, body (11.6?)--14.1 mm; antenna 6.57--8.4 mm, 34--37 segments, first flagellar segment 3.78--4.57 times as long as wide, combined length of second and third segments 1.02--1.14 times first; head thickness-width ratio 1.54--1.63, head length-width ratio 1.06--1.2, head thickness-camber ratio 4.0--5.2, occipital camber 4.9--6.56, head-occiput width ratio 1.2--1.35, eye-temple ratio 1.45--1.85; mesoscutum index 1.02--1.12, head width 1.29--1.49 times mesoscutum width, scutellum 1:0.95--1.2:0.5--0.75; depth:width:length of propodeum 1:1.12--1.2:1.1--1.22; hindbasitarsus 5.6 (not compressed)--7/7.7 (compressed) times as long as thick (of the five specimens measured--selected to give a size distribution--all had compressed tarsi except the one with 5.6 ratio and one with ratio 7.33), first tergite 1.36--1.56 times as long as hindbasitarsus; width of post-petiole 0.57--0.7 times length, first tergite 3.46--3.98 times as long as post-petiole.

Structure and sculpture generally as in female, but frons, stemmaticum, and vertex more finely shallowly punctate and polished; antenna barely compressed except first flagellar segment; scutellum with longitudinal ridges and furrows only in slightly less than one-half of specimens and then usually less marked; the compression of the hindtarsus found in most specimens of this species is unusual for males of this genus (in which the typical enlargement in males relative to females is normally more prominent laterally).

Color generally as in female, but usually with greater prevalence of black, especially on mesoscutum and propodeum, the latter usually wholly black except third pleural area and tips of propodeal pedicel. First tergite usually wholly fulvous (leaning toward fulvoferruginous), clasper black or piceous. One specimen is much more extensively fulvoverruginous, with only a restricted black stripe on prescutum, an upper anterior black patch on mesopleurum running into a longitudinal posterior one, and with color of propodeum as in female; another male has thorax wholly black except sutural margins and propodeum also except at base of hindcoxa (notauli in this specimen almost



imperceptible).

Material examined: 26♀♀, 11♂♂.

Type: ♀, Randolph, N. H., July 6 1946, J. Peck & M. Townes (CHT); allotype: ♂, Ithaca, N. Y., V-31-1936, H. K. Townes (CHT); paratypes: ♀♀, Vancouver, B. C., 30-6-1914, R.H.Chrystal (CNC); Woolwich, Me., 1-VIII-1956, G. H. Heinrich (HPH); Pine Ridge, Man., Em. 13-IV-48, F. I. S: W-815, Ex Bapta vestaliata (CNC); Alcona Co., Mich., 7-3-48, R.R.Dreisbach (Dreisbach); Ann Arbor, Mich., May 18 1962, H. & M. Townes (CHT); Benzie Co., Mich., 7-4-57, R.&K. Dreisbach (Dreisbach); Clare Co., Mich., 7-23-28-59, R. R. Dreisbach (Dreisbach); Gogebic Co., M., 6-29-55, R.R. Dreisbach (Dreisbach); Missaukee Co., Mich., 6-30-57, R.&K. Dreisbach (Dreisbach); Oscoda Co., Mich., 2-4-48, R.R.Dreisbach (Dreisbach); Pinkham Notch, N. H., June 25 '38, H. & M. Townes (CHT); Cranberry Lake, N. Y., 6-30-24, E.A. Hartley, coll. (USNM); Ithaca, N. Y., 17-VIII-47 (CNC); Saranac Lake, N. Y., 12-VI-'46, RTMitchell, Collector (RTM); Saranac Lake, N. Y., 26-VI-'46, RTMitchell, Collector (RTM); Saranac Lake, N. Y., 2-VII-'46, RTMitchell, Collector (RTM); Ottawa, Ont., Hog's Back, 17-VI-52, R.S. Bigelow (CNC); Simcoe, Ont., 26-VI-1939, T.N. Freeman (CNC); Mary's Peak, Ore., Jul. 4 1904, JCBridwell, Collector (USNM); MtHollySpgs, Pa, VII-7-1918, RMFouts, Collector (3♀, USNM); Great Smoky Mt. N. P., N. C. Tenn., 18-VI-1957, W. R. M. Mason, Indian Gap, 5200' (CNC); Gr.Smoky Mt. Nat.Pk., Tenn., 18-VI-1957, J.R.Vockeroth, Indian Gap, 5200' (♂ on same pin, CNC); Mason Co., Wash., Lake Cushman, VII-2 1919, F.M.Gaige, 34 (UMI); paratypes: ♂♂, Birds Hill, Man., Em. 18-II-47, F. I. S: W-617, Ex Melanolophia [sic!] canadaria (CNC); Clare Co., M., V-23-59, R.Dreisbach (Dreisbach); Cranberry Lake, N. Y., 6-20-24, E.A.Hartley, Coll. (USNM); Cranberry Lake, N.Y., VII.1.24, E.A.Hartley, Coll. (USNM); Ithaca, N. Y., 6-VI-1947, W. Mason (CNC); Ottawa, Ont., 11-VI-1947, G.S. Walley, Hog's Back (CNC); Berks Co., Pa., 5-VI-38, S. C. Schell, Coll. (HPH); Knowlton, Que., 11-VI-1930, L.J.Milne (CNC); Nominigue, Que., 5-VI-1941, G.S.Walley (CNC); Gr.Smoky Mt. Nat.Pk., Tenn., 18-VI-1957, J.R. Vockeroth, Indian Gap, 5200' (on pin with ♀, CNC).

Hosts: Bapta vestaliata, Melanolophia canadaria (Geometridae).

### 15. Aphanistes fuscipes, new species

Female: Forewing 4.86--6.57 mm, body 8.57--11.9 mm; antenna (wanting in smallest specimen) 6.4--7.7 mm, 32--35 segments, first flagellar segment 4.65--5.5 times as long as wide, combined length of second and third segments 1.02--1.17 times first; head thickness-width ratio 1.56--2.16, head length-width ratio 1.18--1.2, head thickness-camber ratio 2.8--3.65, occipital camber 3.5--4.4, head-occiput width ratio 1.27--1.4, eye-temple ratio 1.88--2.16; mesoscutum index 1.05--1.12, head width 1.48--1.6 times mesoscutum width, scutellum 1:0.89--1.1:0.6--0.7; depth:width:length of propodeum 1:1.04--1.14:1.16--1.26; hindbasitarsus 8.25/9.43--9.22/9.76 times as long as thick (all compressed: most extreme ratio of thickness to length 8.9/10.4), first tergite 1.35--1.53 times as long as hindbasitarsus; width of postpetiole 0.52--0.59 times length, first tergite 3.4--4.2 times as long as postpetiole.

Habitus moderately slender. Head subbuccate to slightly convergent behind (broadly elliptical); face rather polished, but with numerous fine punctures; cheek and temple very finely sparsely punctate; frons and vertex finely shallowly punctate, punctures separated by own diameter or more, wholly without



rugulae or with punctures between rugulae or relatively closely rugulose and subpolished, most frequently polished, top of head always slightly convex; head profile very convex, usually with a rather distinct change of direction between face and clypeus. Epomia distinct, form rounded; enclosure from about size of tegula to about one-half that size; pronotum more or less rugose; mesoscutum and mesopleurum with rather fine sharp rather sparse punctures; notauli fairly sharply impressed, meeting before prescutellar black patch (usually finely transversely rugulose) in distinct depression in front of which prescutum often longitudinally rugulose, prescutum rather strongly raised above parapsides; mesopleurum usually with more or less rugulosity beneath wings; scutellum very slightly elevated with slight anterior declivity and broad shallow longitudinal depression the width of disc. Propodeum impunctate with only indistinct areolation; petiolar area and third lateral area with distinct transverse rugae, sometimes transverse rugae dominate propodeum--rugosity other than in areola and third lateral area often very weak. Hindfemur incrassate; hindtarsus usually compressed (at least one specimen--not included in measurements above--has no perceptible difference between transverse and vertical dimensions). First tergite at least slightly wider than deep throughout.

Antenna brown. Head yellow except tip of mandible, more or less of frons, stemmaticum, vertex (except orbital spot), and upper part of occiput black. Body generally fulvous except for the usual black patch before scutellum, tip of hindtibia, and midline of second tergite. Boundary between pronotum and mesoscutum often yellowish; prepectus and adjacent area of mesopleurum yellow or yellowish, disc of scutellum sometimes yellowish; midline of prescutum sometimes infusate anteriorly. First tergite, hindfemur, and abdomen usually darker. Spot beneath forewing, base of propodeum, and hindcoxa above sometimes infusate or black; abdomen usually blotched with black apically. All tarsi yellow except hindbasitarsus brown at base.

Male: Forewing 5.03--6.54 mm, body 9.5--12.14 mm; antenna 6.2--7.9 mm, 33--35 segments, first flagellar segment 4.1--5.4 times as long as wide, combined length of second and third segments 1.01--1.2 times first; head thickness-width ratio 1.55--1.73, head length-width ratio 1.11--1.19, head thickness-camber ratio 2.46--3.63, occipital camber 3.3--4.5, head-occiput width ratio 1.24--1.34, eye-temple ratio 1.75--2.46; mesoscutum index 1.08--1.16, head width 1.43--1.54 times mesoscutum width, scutellum 1:0.9--1.0:0.5--0.65; depth:width:length of propodeum 1:1.08--1.175:1.06--1.2; hindbasitarsus 6.6/7.2 (compressed)--8.5 (compressed in basal fifth, depressed at apex) times as long as thick, first tergite 1.46--1.58 times as long as hindbasitarsus; width of postpetiole 0.479--0.58 times length, first tergite 3.23--3.935 times as long as postpetiole.

Structure and sculpture generally as in female except frons and vertex usually rugulosopunctate or sometimes with only a few short rugulae. Notauli especially deep, often with large punctures at bottom producing a ladderlike effect. Propodeum more distinctly rugose, somewhat areolated.

Color generally as in female, but usually with somewhat more black and yellow: head often more extensively black, mesoscutum almost always with black on prescutum, sometimes wholly black, black area beneath wings, sometimes blotches on mesopleurum, at least base of propodeum black, sometimes wholly black except pleural area; hindcoxa and first tergite more or less infusate or black; seventh and eighth tergites and clasper and usually also sixth tergite black; disc of scutellum usually yellow or yellowish, rarely with only slight yellow tinge; pleural area of propodeum yellow or sometimes only



yellowish.

Material examined: 21♀♀, 24♂♂.

Type: ♀, York Co. near Highspire, Pa., 7-18-'09, WSFisher, Colr (USNM); allotype: ♂, MARYLAND, Glen Echo, R. M. Fouts (USNM); paratypes: ♀♀, Cabin John, Md., June 26, 191(4?), RMFouts, Collector (USNM); Glen Echo, Md, July 23 1921, J.R.Malloch, Collector (2♀, one USNM, one HPH); MARYLAND, Glen Echo, R. M. Fouts (USNM); Takoma Pk., Md., VI-23, 1943, H. & M. Townes (CHT); Takoma Pk., Md., VI-27, 1943, H. & M. Townes (CHT); Takoma Pk., Md., VII-1, 1943, H. & M. Townes (CHT); Takoma Pk., Md., VIII-9, 1943, H. & M. Townes (CHT); Takoma Pk., Md., VIII-10, 1943, H. & M. Townes (2♀, CHT); Takoma Pk., Md., VIII-12, 1943, H. & M. Townes (CHT); Chesilhurst, N. J., June 25, 1939, H. K. Townes (CHT); Riverton, NJ, 7-12-08, GMGreene, Collector (USNM); Rossville, Staten Isl NY, July 18, 1925, FM Schott (USNM); Wake Co. NC, VI-10 1951, H&M Townes (♂ on same pin, CHT); Wake Co. NC, VI-20 1951, H&M Townes (CHT); DunnLoring, Va., VIII-28 1948, Karl V. Krombein (CHT); DunnLoring Va., VI-26 1949, K. V. Krombein (CHT); DunnLoring Va., VIII-21 1949, K. V. Krombein (CHT); Dunn Loring Va., VII-15-51, K. V. Krombein (CHT); paratypes: ♂♂, F66 (USNM); Beltsville, Md, 6-23-18, on Quercus alba, WLMcAtee, Collector (USNM); MARYLAND, Glen Echo, R. M. Fouts (4♂ including allotype, three USNM, one HPH); Glen Echo, Md., June 11 1922, JRMalloch, Collector (3♂, USNM); Glen Echo, Md., June 18 1922, JRMalloch, Collector (USNM); Glen Echo, Md., June 25 1922, JRMalloch, Collector (USNM); Glen Echo, Md., July 2 1922, JRMalloch, Collector (USNM); Takoma Pk., Md., VII-1, 1943, H. & M. Townes (CHT); Takoma Pk., Md., VIII-3, 1943, H. & M. Townes (2♂, CHT); Takoma Pk., Md., VIII-9, 1943, H. & M. Townes (CHT); Takoma Pk., Md., VIII-12, 1943, H. & M. Townes (3♂, CHT); Wake Co. NC, VI-10 1951, H&M Townes (on same pin with ♀, CHT); Greenville, SC, VI-14 1952, G.&L. Townes (CHT); Wattacoo, Pickens Co., S.C., VI-21-59, G. F. Townes (CHT); Arlington, Va., VII-5 1948, KVKrombein (CHT); Dunn Loring, Va., VIII-28 1948, Karl V. Krombein (CHT).

#### The Puparum Group

In this group, the ocelli are of normal size for the genus, eye of moderate size but projecting very little from the head outline in plan view; head moderately to strongly buccate, curve of occiput relatively flat, temple usually forming rather sharp, sometimes very sharp angle with occiput; face and clypeus in profile form nearly straight line; frons, stemmaticum, vertex, and temple form continuous nearly unbroken surface except for ocelli, sometimes indistinct ridges (composed of rugulae) between lateral ocelli and median ocellus, and unusually small antennal scrobes; epomia often somewhat indistinct, usually consisting of multiple rugulae rather than a distinct single carina, enclosure slightly larger than tegula, more than one-half as wide as long; mesopleurum rather coarsely and densely punctate in contrast to mesoscutum rather finely and sparsely punctate, except in Texas specimen, where relationship reversed (most other species have sculpture of mesopleurum and mesoscutum similar); scutellum sometimes slightly wider than long, but convergent caudad, moderately elevated, lateral carina obsolete; notauli very indistinct; propodeum rather polished with weak rugulosity, median longitudinal carina obsolete except at areola. Contains only the species puparum.



16. Aphanistes puparum (Ashmead)

Agrypon puparum Ashmead, 1890 (1889). U. S. Natl. Mus., Proc. 12: 424.

Type: ♀, Alameda, California, reared from unknown noctuid (in U. S. National Museum, Natural History, Washington, D. C.).

Female: Forewing 6.6--9.6 (10) mm (figures in parentheses refer to Texas specimen), body 10.3--15.2 (18.4) mm; antenna 6.4--8.2 mm (only three specimens with complete antennae), 33--36 segments, first flagellar segment 4.0--4.42 times as long as wide, combined length of second and third segments 0.92--0.98 times first; head thickness-width ratio 1.58--1.8, head length-width ratio 1.12--1.16, head thickness-camber ratio 3.1--4.5, occipital camber (4.6) 5.25--6.14, head-occiput width ratio 1.14--1.166 (1.28), eye-temple ratio (1.2) 1.3--1.85; mesoscutum index 1.1375--1.21 (1.26), width of head (1.304) 1.39--1.45 times mesoscutum width, scutellum 1:0.9--1.1:0.6--0.7; depth:width:length of propodeum 1:1.0--1.2:1.02--1.15; hindbasitarsus 6.5--8.19 (8.33) times as long as thick, first tergite 1.16--1.33 times as long as hindbasitarsus; width of postpetiole 0.61--0.65 (0.76) times length, first tergite 3.4--4.12 (4.19) times as long as postpetiole.

Habitus somewhat stout. Head moderately to strongly buccate, curve of occiput relatively flat, eye projecting little from head outline in plan view; temple weakly to moderately convex, usually forming rather sharp, sometimes very sharp angle with occiput; frons, stemmaticum, vertex, and temple forming continuous nearly unbroken surface except for ocelli and sometimes indistinct ridges (composed of rugulae) between lateral ocelli and median ocellus and unusually small antennal scrobes; face and clypeus in profile forming nearly straight line; face with rather dense, rather shallow punctures, rather polished, frons rugulosoreticulate (i. e., with rather large shallow punctures separated by much less than their diameter, leaving only rugulae between), usually forming rugulae or rugae along forward edge of stemmaticum; vertex and gena moderately closely rather shallowly and finely punctate, punctures separated by more than their diameter, polished, gena with orbital band one-fifth to one-half its width with considerably reduced punctation (fine, shallow, sparse). Pronotum and mesoscutum rather finely distinctly sparsely punctate (punctures separated by one to two times their diameter) and subpolished; mesopleurum and scutellum polished, rather more closely and deeply punctate than mesoscutum, especially in larger specimens with predominantly brown color (except Texas specimen, in which punctures of both mesopleurum and mesoscutum are of about same size and depth, but very dense on the latter and somewhat sparse on the former, mesoscutum subopaque, mesopleurum rather polished--specimens from all localities agree in having a difference in density of punctation between dorsum and pleurum in contrast to the relative identity in most other species); epomia often somewhat indistinct and usually consisting of multiple rugulae rather than a distinct single carina (in predominantly black specimens, epomia may be subobsolete and adjacent edge of collar nearly absent), often lower end more or less distinct (epomia most complete and most nearly a single carina in Texas specimen), enclosure slightly larger than tegula, more than one-half as wide as long; notauli rather broad and very shallow and weakly indicated, chiefly represented by change of direction from parapsides to moderately to considerably elevated prescutum, especially in black specimens: faintly impressed in brown specimens; scutellum moderately elevated, without distinct lateral carina, with a distinct



anterior slope, sometimes slightly wider than long but distinctly convergent caudad; prepectus without pleural carina, not different in sculpture from pleurum; some rugulae under wings. Propodeum usually with weak to obsolete, rarely with moderate rugulosity (least in predominantly black, most in predominantly fulvo ferruginous specimens), at most pleural and lateral longitudinal carinae and the portion of median longitudinal carina at areola distinct, first two sometimes strong, sometimes only the anterior portions of these present, areola obsolete; in all specimens propodeum is subpolished (slightly finely weakly reticulate in one or two fulvo ferruginous specimens), dorsal surface rather smooth and rounded and posterior portion of petiolar area with transverse rugulae. Hindfemur somewhat stout. Postpetiole rather deep (0.81--0.87 times width), often widest at apex; petiole more or less elevated for some distance cephalad of spiracles.

Antenna brownish or fulvous. Clypeus, face, orbital spot, lower surface of scape, mandible except tip, and cheek yellow; temple fulvous with black margin adjacent to occiput or wholly black; frons, stemmaticum, and vertex black (except Texas specimen, in which rather broad yellow band entirely encircles eye, only middle of frons and stemmaticum black); upper part of occiput and tip of mandible black. Thorax fulvo ferruginous, with more or less of propleurum and pronotum, patch before and side of scutellum, spot beneath wings, sterna, band across base of propodeum, and metakatepisternum black; the black may be more extensive to the point of the entire thorax being black except parapsides, spot at apex of scutellum, metakatepimerum, propodeal pedicel, and some small spots on mesopleurum. Fore- and midlegs yellow with more or less fulvous on tibiae and femora, hindleg fulvous except upper surface of coxa usually black, upper surface of femur usually ferruginous, apex of tibia usually black (in a few specimens merely fuscous), and tarsus yellow (no yellow on tibia!). Wings sometimes hyaline, usually subhyaline, sometimes slightly infusate. Abdomen fulvo ferruginous, mesal portion of second tergite and upper surface of apical tergites black, first tergite usually ferruginous, sometimes infusate to black above (according to original description, postpetiole and second and following tergites above black in type--this cannot be checked, since the type specimen now lacks abdomen).

Male: Forewing 7.0--9.6 mm, body 12.3--17.0 mm; antenna (only two: one apparently broken after I measured it) 7.4--8.5 mm, 34--36 segments, first flagellar segment 3.94--4.375 times as long as wide, combined length of second and third segments 0.87--0.97 times first; head thickness-width ratio 1.54--1.71, head length-width ratio 1.16--1.18, head thickness-camber ratio 3.3--4.1, occipital camber 4.6--5.66, head-occiput width ratio 1.16--1.22, eye-temple ratio 1.2--1.95; mesoscutum index 1.11--1.24, head width 1.4--1.49 times mesoscutum width, scutellum 1:1.0--1.1:0.53--0.625; depth: width:length of propodeum 1:1.02--1.24:1.08--1.24; hindbasitarsus 4.66--7.69 times as long as thick, first tergite 1.136--1.4 times as long as hindbasitarsus; width of postpetiole 0.55 (?--damaged)--0.68 times length, first tergite 1.41--1.46 times as long as postpetiole.

Habitus generally as in female, but head in profile rather round, the line of face and clypeus slightly convex but with a very inconspicuous separation. Sculpture generally as in female, but rugulosity beneath wings usually more distinct and more extensive. Color in general as in female but with greater amount of black: thorax may be wholly black except for metanepisternum, more or less of metakatepimerum immediately before hindcoxa, and propodeal pedicel. First tergite tends to be ferruginous or fuscous and its dorsum may be piceous to black, especially upper surface of postpetiole; apical ter-



gites more extensively black than in female; clasper black.

Material examined: 15♀♀, 12♂♂.

Distribution: middle California from north of Sacramento to north of Los Angeles; northeastern Texas (near Fort Worth).

Hosts: 'unknown noctuid' (type).

### The Crassulus Group

In this group, the ocelli are of normal size for the genus, eye of moderate size and distinctly projecting from outline of head in plan view, head subbuccate to buccate, face in profile slightly to moderately prominent; space enclosed by epomia moderately to very small, narrow; pronotum narrow (width about one-third length), mesoscutum rather wide in proportion to its length (except Florida specimen), slightly to moderately gibbous; notauli shallowly narrowly distinct to obsolete; scutellum appears square or wider than long, little narrowed behind; propodeum with median longitudinal carina distinct and other traces of areolation, propodeal fossa very shallow to wanting; thorax and hindfemur and hindtarsus stout; postpetiole rather long in proportion to petiole, usually convergent caudad from spiracles. Species included are crassulus, flaviscutellaris, and decurvihastatus.

#### 17. Aphanistes crassulus, new species

Female: (Data in parentheses refer to specimen from Florida.) Forewing 5.46-8.4 (10.4) mm, body 8.5--14.65 (18.6) mm; antenna 5.7--8.8 (ca. 10) mm, 29 (estimated)--40 (more than 40) segments, first flagellar segment (4.0) 4.1--4.5 times as long as wide, combined length of second and third segments (0.825) 0.86--1.04 times first; head thickness-width ratio 1.6--1.74, head length-width ratio (1.11) 1.12--1.15, head thickness-camber ratio 3.4--5.0, occipital camber (4.05) 4.45--6.7, head-occiput width ratio 1.2--1.26 (1.38), eye-temple ratio (1.4) 1.5--1.75; mesoscutum index 1.05--1.06 (1.22), head width (1.31) 1.37--1.56 times mesoscutum width, scutellum 1:0.7--0.825 (0.95):0.5--0.7; depth:width:length of propodeum 1:(1.1) 1.12--1.18:0.96--1.16, hindbasitarsus 5.6--7.9 times as long as thick, first tergite (1.28) 1.42--1.5 times as long as hindbasitarsus; width of postpetiole 0.54--0.655 times length, first tergite 3.4--3.6 times as long as postpetiole.

Habitus rather stout. Head rounded rectangular, moderately transverse; upper third of clypeus moderately closely punctate (more than one-half as many punctures per unit area as on face--rare in our species of genus) except in a very few specimens (chiefly the smallest); face much wrinkled and punctate, slightly prominent in profile, inner orbit moderately punctate with only a narrow band of reduced punctation next to orbit; cheek rather densely punctate with a decrease in density just below middle and an increase in density and depth (but punctures small throughout) toward temple; frons, stemmaticum, and vertex moderately densely and deeply punctate, usually with distinct but not strong rugulae on frons, ocellocular space essentially impunctate (in small specimens, punctation of cheek, temple, and stemmaticum sparser and weaker); mandible rather strongly punctate. Thorax generally rather densely and deeply punctate, including prepectus, punctures on mesopleurum larger (separated by about one-third their diameter) than those on mesoscutum (separated by about one-half their diameter); notauli moderately distinct,



narrow but not sharply impressed, extending at least halfway to scutellum, prescutum more or less distinctly elevated above parapsides; scutellum rather strongly rather densely punctate, punctures separated by less than one-half their diameter, scutellum distinctly elevated anteriorly, with rounded transverse angle between steep anterior surface and sloping disc with distinct shallow median longitudinal depression, usually extending from side to side, sometimes reduced to short longitudinal depression in midline near base, lateral carina obsolete to wanting; epomia distinct, forming smooth curve, usually completely closed, enclosure rather small, one-fourth or less length of anterior margin of pronotum, roughly one-half as wide as long; mesopleurum with some rugulae or reticulations beneath wings, usually extending back onto upper part of speculum, lower half of speculum polished impunctate; prepectal carina present on at least lower third of pleural margin; sternaulus short, weak to obsolete (in small specimens more sharply--sometimes sharply--impressed; polished area on speculum sometimes nearly absent). Propodeum strongly rather coarsely rugose-reticulate, with rather distinct but small and shallow punctures between the rugae (reticulations about one-eighth length of propodeum); area dentipara and areola very little more strongly punctate than remainder, areola usually not closed behind; petiolar area moderately depressed longitudinally, with narrow parallel-sided "gutter," slightly further depressed, from areola to base of pedicel; first and second lateral areas usually not separated, combined area dentipara about as wide as long; anterior portions of lateral longitudinal carina and pleural carina strong, median longitudinal carina rather distinct. First tergite in plan view widening to spiracles, then narrowing to apex; postpetiole long and elevated, elevation extending cephalad of spiracles, total elevated portion more than one-half length of tergite, upper surface of tergite more or less flattened, petiole usually wider than deep, with a median longitudinal rounded groove that extends onto postpetiole, where there usually are two short similar grooves between it and spiracles. Hindleg very stout. Ovipositor much deeper than wide.

Antenna dark fulvous to light fuscous. Mandible except black tip, clypeus, face including space between antenna and eye margin and extending short distance onto frons, orbital spot, and lower part of cheek yellow; frons, stemmaticum, and upper part of occiput black; upper part of cheek, temple, and vertex fulvoferruginous (vertex and temple often piceous or black). Thorax fulvoferruginous, with patch on mesoscutum before scutellum, side of scutellum, and mesosternum black, scutellum very rarely slightly yellowish at base; black on sternum may extend up onto lower part of mesopleurum; usually a black spot beneath wings; metanepimerum, metasternum, metakatepisternum, basal area, areola, area dentipara, and petiolar area may also be black. Tip of hindtibia black; hindcoxa and -trochanters may be more or less black above; fore- and midlegs yellow with more or less fulvous on tibiae, femora, and coxae; base of hindtibia more or less yellow or yellowish, hindtarsus yellow. Abdomen fulvoferruginous with broad midline of second tergite black; sometimes first tergite infuscate or with some piceous, apical tergites sometimes black.

Specimen from Florida differs from the others in that only the ridges between lateral ocelli and median ocellus, spots on mesosternum before coxae, and midline of second tergite are black; tip of mandible, small patch before scutellum, and mesal line of mesosternum piceous; apex of hindtibia fuscous, propodeal pedicel yellow, head wholly yellow except as just indicated and about middle half of frons and upper part of occiput fulvoferruginous.

Male: Forewing 5.6--7.6 mm, body 9.5--13.4 mm; (no complete antennae), first flagellar segment 4.35--4.66 times as long as wide, combined length of



second and third segments 0.87--0.94 times first; head thickness-width ratio 1.62--1.75, head length-width ratio 1.14--1.24, head thickness-camber ratio 3.4--4.8, occipital camber 4.5--6.3, head-occiput width ratio 1.24--1.34, eye-temple ratio 1.575--1.9; mesoscutum index 1.10--1.12, head width 1.36--1.44 times mesoscutum width, scutellum 1:0.90--0.93:0.53--0.6; depth:width: length of propodeum 1:1.14--1.2:1.04--1.06; hindbasitarsus 5.4--6.3 times as long as thick, first tergite 1.44--1.64 times as long as hindbasitarsus; width of postpetiole 0.55--0.66 times length, first tergite 3.45--4.24 times as long as postpetiole.

Habitus and sculpture in general as in female, but wrinkles on face and rugulae or reticulations on frons slight or absent, gena including temple with much weaker punctation, middle portion often almost impunctate. Epomia closed, enclosure very narrow (less than one-third as wide as long); speculum sometimes almost without polished area; mesopleurum often without rugulae or reticulations under wings. Cheek and temple usually wholly yellow or yellowish-fulvous; mesoscutum sometimes with a thin piceous-to-black median longitudinal line; mesopleurum usually with narrow oblique black line tilting backward toward top of speculum and sometimes with large roundish spot under forewings. Metasternum black (rare in female).

Material examined: 72♀♀, 7♂♂.

Type: ♀, Kingston, R.I., VII-18 1937, M Chapman (CHT); allotype: ♂, Millwood, N. Y., Jun. 20 1936, H. K. Townes (CHT); paratypes: ♀♀, 2 mi. W of Archer, Fla., Mar. 25 1953, H. F. Howden (CHT); Club Hill, Md., 7/14/32 (CHT); Beltsville Md., VII-21 '47, R. Boettcher (USNM); PlummerIsl. Md, 4-VII '21 (USNM); Takoma Pk., Md., VII-18, 1942, H. & M. Townes (CHT); Takoma Pk., Md., VI-11, 1944, H. & M. Townes (CHT); Ex leaf-roller, Lynnfield, Mass 2-6-22, GipMothLab, 12164G68 (USNM); Ontonogan Co., Mich., 6-18-60, R. and K. Dreisbach (Dreisbach); Wayne Co., Mich., Grosse Ile, July 15, 1961, Geo. Steyskal (CHT); Moorestown, N. J., June 11, 1939, H. & M. Townes (CHT); Moorestown, N. J., June 14, 1939, H. & M. Townes (CHT); Moorestown, N. J., June 22, 1939, H. & M. Townes (CHT); Moorestown, N. J., June 25, 1939, H. & M. Townes (CHT); Moorestown, N. J., June 27, 1939, H. & M. Townes (CHT); Moorestown, N. J., July 1, 1939, H. & M. Townes (2♀, CHT); Moorestown, N. J., July 4, 1939, H. & M. Townes (CHT); Moorestown, N. J., July 5, 1939, H. & M. Townes (CHT); Moorestown, N. J., July 6, 1939, H. & M. Townes (CHT); Moorestown, N. J., July 9, 1939, H. & M. Townes (CHT); Farmingdale, N. Y., Jul 26 '38, H. & M. Townes (CHT); Millwood, N. Y., Jun. 27 1936, H. K. Townes (CHT); Yonkers, N. Y., 4 July 1935, L. L. Pechuman (CHT); Clinton, N. C., May 24 1951, H&M Townes (2♀, CHT); Poplar, N. C., 15-VII-1936, D.L. Wray (USNM); Deerlock, Ont., 18-VII-1960, S. M. Clark (CNC); Coraopolis, Pa., July 13, 1907 (3♀, Pittsburgh); Crisp, Pa., C.M.Acc.321, July 190 [sic!] (Pittsburgh); All'y Co., Penna., Kenneywood, July 9, 1907 (2♀, Pittsburgh); MtHollySpgs, Pa., VII-7-1918, R.M. Fouts, Collector (USNM); F31Pa, Mt. Holly Spgs., Pa. 8-25-20, R.M. Fouts, Coll. (USNM); North East, Pa., 1914, RACushman, Collector (USNM); Pittsburg [sic!], Pa, June (2♀, Pittsburgh); Rockville, Pa., 14-VII-10, P. R. Myers (USNM); Westmoreland Co., Pa., July (19♀, Pittsburgh); Westmor.Co., Pa., July 190 [sic!] (3♀, Pittsburgh); Wissahickon Val., Philadelphia, Pa., 26-VI-1935, H. P. Hopper (HPH); Westerly, R. I., VII-5 1936, M. Chapman (2♀, CHT); Westerly, R. I., VII-6-1936, M. Chapman (CHT); Cleveland, S. C., V-7-1961, G. F. Townes (CHT); Va near PlummersIsl, 3-VII '21 (2♀, USNM); Lost River St. Pk., Hardy Co., W.Va., VII-5 1953, Karl V. Krombein (2♀, CHT); Polk Co., Wis.,



July, Baker, Collector CFBaker (USNM); paratypes: ♂♂, PlummersId, Md, VI-24-17, GMGreene, Collector (USNM); Ontonogan Co., Mich., 6-18-60, R. and K. Dreisbach (Dreisbach); All'y Co., Penna., Kenneywood, July 9, 1907 (3♂, Pittsburgh).

Hosts: "leaf-roller."

# 18. Aphanistes flaviscutellaris, new species

Female: Forewing 5.45--6.65 mm, body 8.26--11.06 mm; antenna 5.75--6.37 mm (only two complete), 31--32 segments, first flagellar segment 3.8--4.4 times as long as wide, combined length of second and third segments 1.0--1.2 times first; head thickness-width ratio 1.54--1.84, head length-width ratio 1.15--1.24, head thickness-camber ratio 3.75--5.54, occipital camber 4.86--6.86, head-occiput width ratio 1.27--1.37, eye-temple ratio 1.56--2.2875; mesoscutum index 0.96--1.02, head width 1.406--1.537 times mesoscutum width, scutellum 1:0.94--1.1:0.55-0.9; depth:width:length of propodeum 1:1.1--1.14:0.96--1.0; hindbasitarsus 5.1--7.1 times as long as thick, first tergite 1.6--1.7 times as long as hindbasitarsus; width of postpetiole 0.56--0.72 times length, first tergite 3.58--4.0 times as long as postpetiole.

Habitus somewhat stout. Head rather buccate, transverse, lower part of head in profile quite short, profile suborbicular; face slightly prominent, median field rather rugulosopunctate, inner orbit broadly nearly impunctate; clypeus with few punctures, especially below; gena very sparsely finely shallowly punctate; frons, stemmaticum, and vertex rather weakly and sparsely punctate, especially frons and vertex and especially toward edges, with very weak rugulae on frons, rather polished, stemmaticum little elevated. Epomia enclosing short and narrow space (one-third to one-fifth as long as wide), posterior margin rather straight and parallel to margin of collar; notauli usually fairly distinct at least in anterior third, though not sharp, prescutum little or not at all raised; mesoscutum fairly densely finely distinctly punctate, punctures on mesopleurum larger, sparser, and shallower; speculum with only very narrow polished anteroventral edge; scutellum flat, anterior margin not at all elevated, shallowly longitudinally depressed from side to side, lateral carina more or less distinct. Propodeum rather finely weakly rugulosoreticulate. First tergite widened before spiracles but very little or not at all elevated, postpetiole quite flat with three distinct longitudinal furrows. Legs very stout. Ovipositor much deeper than wide, rather deep in proportion to its length, not decurved (or very slightly and beyond nodus), nodus rather long and large, ovipositor tip proportionately long.

Color generally fulvous. Antenna fulvous. Head yellow with tip of mandible, stemmaticum, and upper part of occiput black, temple fulvoferruginous. Mesopleurum and propodeum may have fairly extensive black markings; scutellum more or less yellowish; first tergite often infuscate. Wings hyaline to subhyaline with brown hairs.

Male: Forewing 5.35--6.0 mm, body 10.25--11.8 mm; antenna 6.35--7.0 mm, 31--34 segments, first flagellar segment 4.5--4.66 times as long as wide, combined length of second and third segments 1.036--1.185 times first; head thickness-width ratio 1.67--1.796, head length-width ratio 1.128--1.217, head thickness-camber ratio 3.46--4.166, occipital camber 4.45--6.9, head-occiput width ratio 1.208--1.326, eye-temple ratio 2.08--2.1; mesoscutum index 1.0--1.05, head width 1.43--1.5 times mesoscutum width, scutellum 1:1.0--1.1:0.75--0.85; depth:width:length of propodeum 1:1.08--1.2:1.04--1.14; hind-



basitarsus 5.3--5.7 times as long as thick, first tergite 1.6--1.7 times as long as hindbasitarsus; width of postpetiole 0.52--0.63 times length, first tergite 3.57--3.93 times as long as postpetiole.

Sculpture and color as in female, but with somewhat more black; mesopleurum and metapleurum often with some yellow markings.

Material examined: 8♀♀, 3♂♂.

Type: ♀, Sand Lake, Ont., 3-VII-1926, F. P. Ide (CNC); allotype: ♂, Pittsburgh [sic!], Pa, June 3 (Pittsburgh); paratypes: ♀♀, Gull Lake Biol. Sta., Kalamazoo Co., Mich., 11 July 1955, Collector, A. D. Dawson (MSEL); Midland Co., Mich., 7-10-52, R. R. Dreisbach (Dreisbach); Blackburn, Ont., 18-VI-1941, G. S. Walley (CNC); One Sided Lake, Ont., 2-VI-1960, S. M. Clark (CNC); Simcoe, Ont., 22-VI-1939, T. N. Freeman (CNC); Brome, Que., 31-V-1936, G. S. Walley (CNC); Lac Brule, P. Q., 8-VIII-1945, O. Peck (CNC); paratypes: ♂♂, Simcoe, Ont., 22-VI-1939, G. S. Walley (2♂, CNC).

#### 19. Aphanistes decurvihastatus, new species

Female: Forewing 6.2--7.05 mm, body 10.3--12.2 mm; antenna 7.3--7.5 mm (only two specimens with complete antennae), 36--37 segments, first flagellar segment 3.5--4.5 times as long as wide, combined length of second and third segments 1.0--1.07 times first; head thickness-width ratio 1.65--1.74, head length-width ratio 1.16--1.19, head thickness-camber ratio 3.5--4.66, occipital camber 4.5--6.4, head-occiput width ratio 1.23--1.32, eye-temple ratio 1.7--2.375; mesoscutum index 1.0--1.14, head width 1.34--1.4 times mesoscutum width, scutellum 1:0.9--0.98:0.65--0.7; depth:width:length of propodeum 1:1.1--1.2:0.98--1.125; hindbasitarsus 5.3--6.6 times as long as thick, first tergite 1.55--1.6 times as long as hindbasitarsus; width of postpetiole 0.52--0.58 times length, first tergite 3.33--3.7 times as long as postpetiole.

Habitus rather stout. Head rounded-rectangular and moderately transverse; median field of face moderately closely but not deeply rugulosopunctate, inner orbit broadly nearly impunctate; cheek narrow, increasingly so toward base of mandible, rather finely sparsely punctate, becoming more closely and deeply punctate above, temple becoming rather rapidly closely deeply less finely punctate, genal portion of occipital carina with more or less distinct angle; frons, stemmaticum, and vertex directly behind stemmaticum very distinctly rugulose-reticulate-punctate, most deeply on vertex, with some rugulae at anterior edge of stemmaticum, grading from subpolished on frons to subopaque on vertex; stemmaticum rather strongly elevated at lateral ocelli, ocellocular line about equal to diameter of lateral ocellus, slightly shorter than interocellar line (ocellocular line:diameter of ocellus:interocellar line 6:6:7), lateral ocellus less than three times thickness of occipital carina from it. Space enclosed by epomia somewhat small, narrow (one-fourth to one-fifth as wide as long); mesoscutum rather closely moderately finely and deeply punctate; prescutum rather strongly raised above parapsides, notauli obsolete; scutellum moderately strongly and closely punctate with a longitudinal concavity usually extending from base to apex and from side to side, disc rather flat with short vertical anterior declivity, lateral carina indistinct, not at apparent lateral margin of disc; prepectus rather polished, punctate or rugulose, without carina on pleurum; mesopleurum moderately densely punctate, somewhat less finely and deeply than mesoscutum; sternaulus rather distinct and sharp but shallow, about one-third length of pleurum; center of



mesopleurum just in front of speculum with very sparsely punctate and polished area, speculum with a distinct polished anteroventral ridge. Propodeum rather strongly rugose, first lateral area usually separated from second, area denti-para not or only slightly longer than wide; areola open behind, petiolar area depressed. Postpetiole approximately parallel-sided, rather narrow and only slightly flattened, with three longitudinal furrows anteriorly, the middle one short and weak; petiole rather flat. Ovipositor rather compressed, rather strongly decurved in apical two-fifths.

Antenna fulvous, head yellow except tip of mandible, mucro of clypeus, frons, stemmaticum, vertex except orbital spot, temple, and upper part of occiput black. Mesoscutum ferruginous, spot on cephalic margin of prescutum and patch before scutellum black; side and apical edge of scutellum black, disc yellow along sides and fulvous medially (in one specimen blackish, but I believe this specimen has been discolored by shellac or the like--see comment on propodeum and first tergite below); pronotum black with upper end ferruginous; mesopleurum largely black with an oblique ferruginous band from base of midcoxa to a little below upper anterior corner, extending upward thence to upper margin and a certain distance backward from there; sterna black. Wings hyaline to subhyaline, with brown hairs. Fore- and midlegs fulvo-ferruginous with tarsi, trochanters, and posterior surface of tibiae yellow; hindcoxa largely black, hindfemur ferruginous, base of hindtibia yellow, merging through fulvous and ferruginous to black at apex (outer half of tibia black), hindtarsus yellow. Propodeum ferruginous with metakatepisternum, basal area, areola, and spot in petiolar area black (one specimen appears to have propodeum entirely black with pleural area piceous and first tergite black, but latter especially is a reddish translucent kind of black suggesting the effect of shellac or the like--see comment on scutellum of same specimen). Abdomen fulvo-ferruginous with second tergite except lateral margins and with blotches at apex black.

Male: Forewing 5.8--6.35 mm, body 10.3--11.5 mm; antenna 6.6 mm (only two specimens with complete antennae), 32 segments, first flagellar segment 4.3--5.2 times as long as wide, combined length of second and third segments 1.0--1.12 times first; head thickness-width ratio 1.635--1.75, head length-width ratio 1.154--1.189, head thickness-camber ratio 3.64--4.5, occipital camber 5.0--5.9, head-occiput width ratio 1.23--1.35, eye-temple ratio 1.66--2.46; mesoscutum index 0.93--1.1, head width 1.25--1.5 times mesoscutum width, scutellum 1:0.96--1.02:0.69--0.9; depth:width: length of propodeum 1:1.06--1.116:0.95--1.03; hindbasitarsus 4.4--6.4 times as long as thick, first tergite 1.436--1.627 times as long as hindbasitarsus; width of postpetiole 0.57--0.76 times length, first tergite 3.4--3.9 times as long as postpetiole.

Sculpture and color much as in female, although punctation slightly weaker, especially top of head, which rather polished; interocellar line about equal to diameter of ocellus and ocellocular line; stemmaticum barely elevated, lateral ocellus one-half its diameter or more from occipital carina. Antenna fulvous to light fuscous, black apex of hindtibia not half its length.

Material examined: 4♀♀, 5♂♂.

Type: ♀, Ithaca, N. Y., 22 July 1940, J. G. Franclemont (CHT); allotype: ♂, Robson, B. C., 3-VI-1947, H. R. Foxlee (CNC); paratypes: ♀♀, Ithaca, N. Y., VI-7 1940, H. & M. Townes (CHT); Ithaca, N. Y., 9 Aug. 1940, J. G. Franclemont (CHT); Ithaca, N. Y., 17 July 47 (CNC); paratypes: ♂♂, Emmet Co., Mich., 5-27-60, R. and K. Dreisbach (Dreisbach); Ontonogan Co., Mich., 6-18-60, R. and K. Dreisbach (Dreisbach); North Branch, Ont., 23-VII-1960,



S.M. Clark (CNC); Sand Lake, Ont., 3-VII-1926, F.P. Ide (CNC).

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